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In THE MUNICIPAL INDEX (an 875-page annual volume published by American City Magazine Corporation) readers will find much material, including articles, lists and bibliographies on a wide variety of municipal and civic subjects, not published in the monthly issues of THE AMERICAN CITY.

See pages 25, 27, 117, 119, 121 for notices of catalogs and publications on municipal and civic subjects

For Index to Advertisements see page preceding back cover

Photo Courtesy Jernigan Photo Service

201 miles of DELAVAUD PIPE in the water system of Fort Worth

Fort Worth, Texas, is recognized as one of the most progressive centers of our great southwest. Here are wide, modern streets flanked by handsome municipal buildings and tall skyscrapers. Here are large modern hotels, theatres and schools. And, beneath the streets of this modern city, more than two hundred miles of deLavaud water mains are giving splendid service.

DeLavaud Pipe was chosen for Fort Worth for the same reason that it was and is being specified by other enterprising cities—its record of economy and excellent performance.

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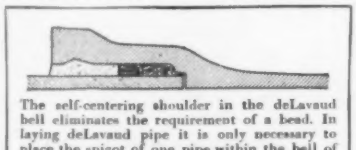

The self-centering shoulder in the deLavaud bell eliminates the requirement of a bead. In laying deLavaud pipe it is only necessary to place the spigot of one pipe within the bell of the next, sliding the pipe forward until it rides upon the taper and automatically centers itself.

DeLavaud Pipe is light in weight too; easy and economical to handle. It is remarkably satisfactory to cut and tap, and it offers approximately 5% greater carrying capacity for the same outside diameter. The illustrated deLavaud Handbook gives detailed information. Write for free copy.

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Our pipe bears the "Q-Check" trademark of The Cast Iron Pipe Research Association

Sales Offices: New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles

Aids from the Federal Bureaus

and other Items of Interest to Mayors and City Managers

Let Uncle Sam Help You

A PUBLICATION which should not be neglected by any administrative city official is "Federal Services to Municipal Governments," a monograph prepared for the Municipal Administration Service by Paul V. Betters (see the Department of Municipal and Civic Publications in this issue.) The report expands in considerable detail the information contained in the section "Municipal Aids from Uncle Sam," published in The Municipal Index for 1924, 1925, 1926 and 1930. As Mr. Betters observes in the Summary, "Many of the most important Federal services to cities are located in unsuspected places, are rendered by agencies whose titles afford little indication of their municipal functions, or are under the jurisdiction of bureaus in a number of different departments." To quote further:

"It is in the several bureaus of the Department of Commerce, for example, that the most varied types of municipal services are to be found. The Bureau of Standards, an agency which to the uninitiated appears too highly specialized in its functions to be of general service, provides invaluable aid to cities in a surprising number of ways. City purchasing agents find its specifications and testing methods indispensable. Weights and measures inspectors have been depending upon its cooperation for many years. Its model building and plumbing codes are being widely incorporated in city ordinances. In city planning and zoning it has influenced and guided progress in many cities through the distribution of its publications. Departments of police and public safety have profited from its traffic and safety codes.* Municipal engineers and city electricians have found the surveys of the Bureau of special value in solving street-lighting problems. Varied as this array of services appears, it includes only a part of the subjects upon which local authorities are free to consult the Bureau of Standards."

Other bureaus in the comprehensive Department of Commerce whose services are worth cultivating include the Bureau of Mines (which "offers aid in solving important problems ranging from smoke abatement to the safe storage of gasoline"), the Aeronautics Branch, the Coast and Geodetic Survey, the Bureau of Fisheries, the Bureau of Foreign and Domestic Commerce, the Office of Education, etc. Another extremely important Government agency is the Public Health Service of the Treasury Department, which is concerned with municipal health administration in at least six of its ten major functions.

Local health officers may also avail themselves of such aids as the vital statistics compiled by the Bureau of the Census, and the services rendered by several bureaus of the Department of Agriculture, including meat inspection surveys, assistance in drafting ordinances, rat control, and cooperation with regard to regulations and standards for food products. Health publications may also be obtained from the Bureau of Home Economics and the Children's Bureau.

Fifty Per Cent Turn-over Every Two Years Among New York State Mayors

MUNICIPAL elections for mayor were held on November 3 in 52 of the 60 cities in New York State. In 6 cities no elections were held, as these have a four-year term of office which expires in 1933. In the other two cities the mayor is chosen by the Common Council at its first meeting on January 1, 1932. The term of office of mayor is two years in 46 cities and four years in 14 cities.

In the 52 cities where elections have just been held, 32 men were elected mayors who had never before held that office, 19 mayors were re-elected, 11 mayors were defeated, and 4 men were elected mayors who had previously held that office. Of the 19 mayors who were re-elected, only 5 had held that office for two consecutive terms, or since 1927, and one had held office for two consecutive terms of four years each.

Mayor Samuel A. Carlson was re-elected Mayor of Jamestown after having held that office for over 20 years, but not consecutively. Mayor John B. Harris was re-elected Mayor of Watertown after a service of two consecutive terms of four years each. Mayor Cornelius E. Burns of Troy was re-elected Mayor for his fourth term of office of two years each. Of the eight cities having four-year terms of office for which elections will be held in 1933, Mayor James J. Walker of New York and Mayor John Boyd Thacher of Albany have been in office since 1926.

An analysis of the length of service of the men who will head the city governments in 1932 shows that over 50 per cent have never before held the office of mayor and of those with previous service only 30 per cent have had over four years' experience as mayor. Except in the 14 cities which have a four-year term of office, only one-third of the mayors have held office for more than two years. In those cities which have a four-year term of office the mayor has been more frequently re-elected than in those cities having a two-year term of office.

Thus the average turn-over of mayors is approximately 50 per cent every two years, and about 80 per cent every four years.

E. D. GREENMAN.

Election Results as to the City Manager Plan

THE city manager plan was adopted on November 3 by the cities of Utica, N. Y., Ashland, Ky., and Oakwood, Ohio, as reported by the International City Managers' Association.

See page 90 of this issue for a discussion of the situation in Cleveland.

Recent City Manager Appointments

A. J. CARVER was appointed City Manager of Walters, Okla., on September 20, to succeed W. R. Lines, who had been City Manager since February, 1928. Prior to his appointment Mr. Carver was Superintendent of the Water and Light Department in Walters.

M. E. Coleman recently succeeded H. P. Giebler as City Manager and City Clerk of St. Mary's, Kans.

Dorsey W. Cook was appointed City Manager of Clarksburg, W. Va., in October, to succeed L. M. Robinson, who had been City Manager since April, 1931.

J. H. Curtis, City Manager of Charles City, Iowa, since January, 1930, was appointed City Manager of Maquoketa, Iowa, effective November 2, 1931. Prior to becoming a city manager, Mr. Curtis had served as County Engineer in several Iowa counties.

Howard Harris, Superintendent of the Water Department of Paul's Valley, Okla., became City Manager of Tecumseh, Okla., in July, 1931. He succeeds R. W. Calloway, who had been City Manager since June, 1929.

J. S. Mathers, a construction engineer, was appointed City Manager of Covington, Va., in October, to succeed R. E. Dyche, who recently resigned to run for election to the office of county sheriff of Allegheny County, Va.

E. M. Shafter succeeded R. J. Whitney as City Manager of Royal Oak, Mich., when Mr. Whitney accepted the position of City Manager of Mamaroneck, N. Y., on October 15. Mr. Shafter, a graduate of the University of Michigan, had been City Engineer and Assistant Manager in Royal Oak.

Fred M. Stephenson was appointed City Manager of Edmond, Okla., in October, to succeed M. W. Keeney, deceased. Mr. Stephenson was at one time business manager of the Oklahoma City University and during the last four years has been identified with contracting work in Edmond. He is an ordained minister and has spent thirty years of his life in the active ministry.

CLARENCE E. RIDLEY,
Executive Secretary, The International City Managers' Association.

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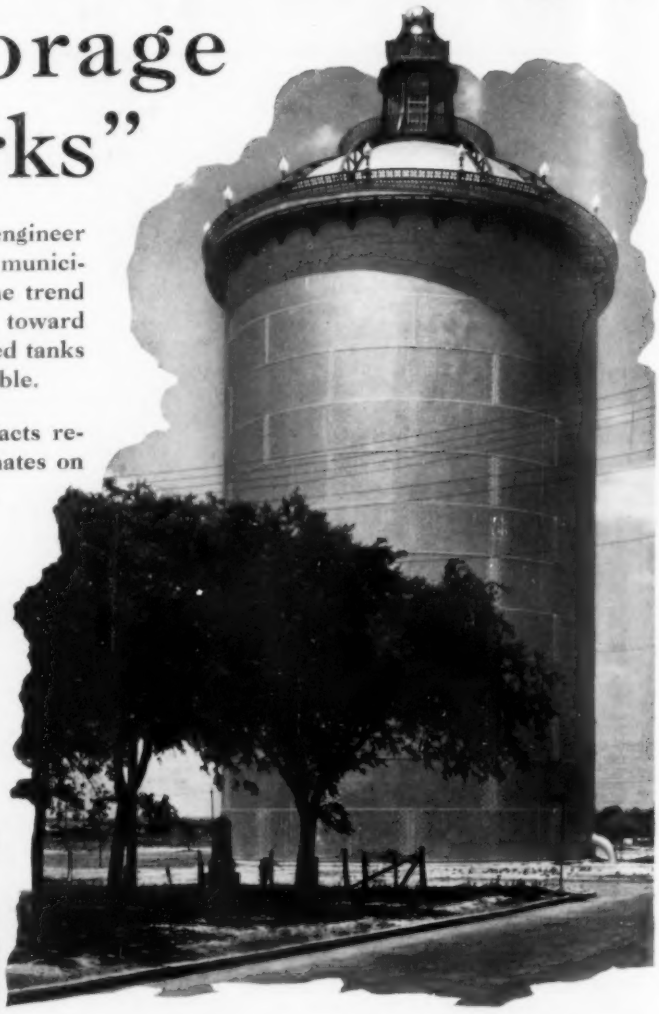
* See page 21 for information of particular interest to departments of police and public safety.

"The trend is toward larger capacity storage in water works"

THIS statement of a prominent waterworks engineer can readily be checked by a study of recent municipal water supply developments. Not only is the trend toward larger capacity but it is increasingly toward *elevated* storage. This supply may be in elevated tanks or in standpipes when high locations are available.

Our nearest office will be glad to give you facts regarding the experience of other cities and estimates on any tank or standpipe you may be considering.



Above: The new steel standpipe in San Antonio, Texas. The elevated storage in this system includes 1,000,000 gallons in tanks and 2,480,000 gallons in the standpipe.

At the left: 1½-million gallon Horton elevated tank at Milwaukee, Wisconsin. This system has 3,000,000 gallons in elevated tanks and 2½ million gallons in reservoirs.

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New York...3108 Hudson Ter. Bldg.	San Francisco.....1033 Rialto Bldg.
Cleveland..2236 Midland Bank Bldg.	Seattle.....4343 Smith Tower
Detroit.....1501 Lafayette Bldg.	Houston.....1101 Electric Bldg.
Phila.2616 "1616" Walnut St. Bldg.	Tulsa.....2425 Exchange Bk. Bldg.
Boston..1501 Consolidated Gas Bldg.	Los Angeles 1303 Pacific Mu. Bldg.
Birmingham....1502 Fiftieth St., N.	Havana, Cuba.....Apartado 2507

HORTON TANKS

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Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Preammoniation at Cleveland

TASTES of an offensive character in the water supply of Cleveland, Ohio, caused by the presence of chlor-phenolic compounds, have been comparatively rare and of but a few days' duration during the past six or seven years. It is probable that a small amount of the liquors from by-product coke-oven plants escapes to Lake Erie through the Cuyahoga River, on which the plants are located. Under winter conditions, with ice floes blocking the mouth of the river, the ice becomes contaminated and, when moved by the wind, may be carried close to the city's intakes and pollute the inflowing water. From November until April these conditions exist, and it is during this period that offensive tastes are likely to occur in the chlorinated filtered water supply of the city.

A special committee consisting of engineers, chemists and sanitarians was appointed to study this problem and to experiment on a sufficient large scale to find a practical method for its solution. In accordance with a report recommending preammoniation in conjunction with chlorination, this process has been adopted and placed in operation at the city's two filtration plants.

The results obtained have confirmed the experimental work. The advantages of the process may be summarized as follows:

1. No chlor-phenolic tastes have been noted since beginning the application of the ammonia prior to chlorination.
2. Chlorinous tastes from residual chlorine have been eliminated.
3. The taste of the water is more acceptable than ever before and no complaints from consumers have been received.
4. The bacterial efficiency of the process is as high as, if not higher than, when chlorine only is used.
5. The prolonged inhibitory effect on bacterial growths is of great value in maintaining a water in its highest state of purity throughout an extensive distribution system.
6. The cost of the equipment for applying the ammonia is merely nominal and may be readily adapted to any existing water plant. The cost of operation for the ammonia is low and will not exceed 30 cents per million gallons of water treated, if the ammonia is purchased at 15 cents per pound.

J. W. ELLMS,
Engineer of Water Purification and Sewage Disposal.

Raw Water Prechlorination

ACCORDING to studies which have recently been made public by the United States Public Health Service, raw water prechlorination, when properly controlled, affords an effective and economical means of reinforcing the bacterial efficiency of rapid sand filtration processes. Experiments have indicated that the permissible density of B. coli in the raw water could be slightly more than doubled by the use of this measure.

Maintenance of a controlled low residual chlorine in the applied water, averaging 0.05 parts per million and not exceeding 0.10 parts per million, gave more consistent and, in general, more satisfactory results than did superchlorination, with a high residual chlorine. The bacterial efficiencies of filtration and of postchlorination appear, from these observations, to be measurably reduced as the result of prechlorination. Although the length of filter run was not increased by prechlorination under the conditions of the experiments, the development of growths of microscopic organisms was perceptibly retarded by this treatment.

The application of prechlorinated water to rapid sand filters appears to lower the bacterial content and the biochemical oxygen demand of the filtering medium. Variations in both of these elements were found to bear a fairly definite relation to concurrent variations in the residual chlorine of the applied water.

More general observations made in the course of the experiments confirmed the prevalent impression that it is advantageous to prechlorinate before, rather than after, preliminary sedimentation in order to utilize the stabilizing effect of basin treatment prior to applying prechlorinated water to filters. They also indicated, however, that even with the stabilizing influence of such basin treatment, careful technical supervision and laboratory control are necessary to maintain a relatively constant chlorine content of water applied to the filters, which appears to be a desirable condition for consistently effective filtration. Although the ability of well-ripened filters to absorb excessive amounts of chlorine for considerable periods of time constitutes a valuable operating factor of safety, in so far as the production of overchlorinated effluents is concerned, any undue burdening of filters with excessively chlorinated water may be expected to result in a measurable impairment of their bacterial efficiency.

The main advantage of prechlorination, from the point of view of this study, may be summed up as being its effectiveness and relative economy as a measure for reinforcing the over-all bacterial efficiency of the rapid sand filtration process, when considered as a whole. Its principal disadvantage seems to be its tendency to cause a perceptible decrease in the bacterial efficiency of filtration and of postchlorination. From a practical standpoint this disadvantage appears to be outweighed by the advantage indicated, but it should be taken into account in considering this method of treatment.

The Water Supply of Warwick, R. I.

UNDER the act empowering the town of Warwick, R. I., to construct a public water-works system, two boards were created. One, termed the Water Supply Board, was entrusted with the construction of the water system, upon the completion of which its duties ceased. The operation of the water system is carried out by the Board of Water Commissioners.

Before undertaking construction, the Water Supply Board caused a thorough engineering investigation to be made in order to satisfy themselves that the project would be a sound one from a financial point of view and would not place a heavy burden upon the taxpayers. Although funds were not available to construct the entire project at the outset, the system was laid out and designed as a complete system which would be ultimately developed to serve the entire area of the town.

The design included an independent water supply to be developed by the town, but studies showed that it would be more economical to purchase water from the adjoining city of Providence. Detailed estimates were made showing the maximum price which the town should pay for water purchased from an outside source, and these figures were used to advantage in arriving at an agreed price for water purchased from the city of Providence.

One portion of the town lying farthest from the source of supply is at such a relatively high elevation that it has been necessary to provide a booster station and elevated tank in order to give satisfactory fire protection.

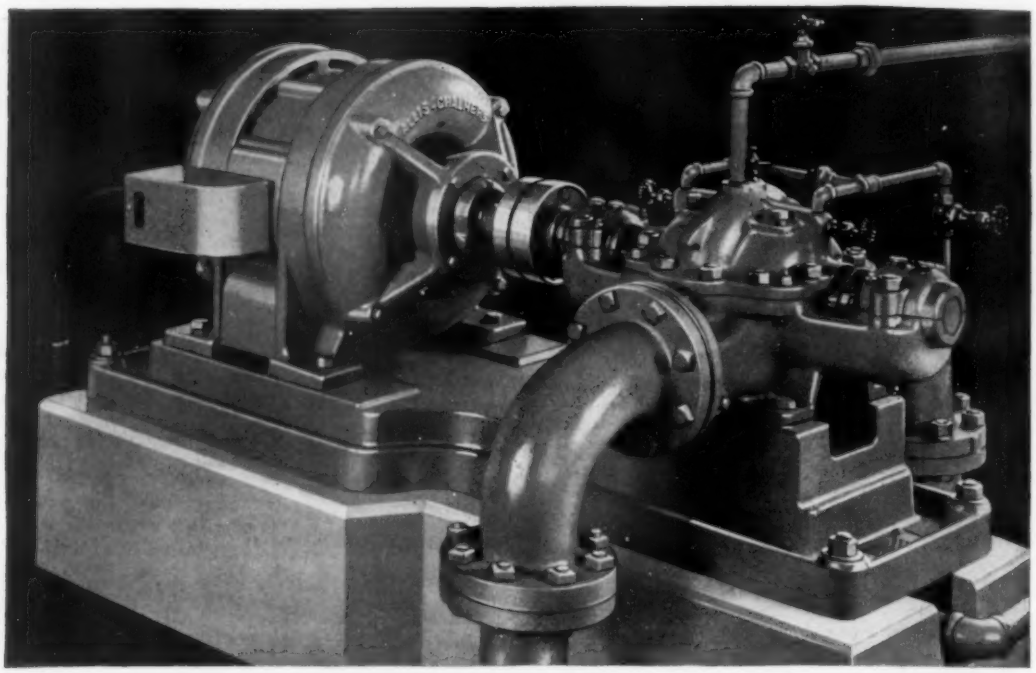
Approximately 108 miles of new water mains, ranging in size from 6 inches to 30 inches, have been constructed under the direction of the Board and about 4,350 service connections have been installed. All service connections are constructed of copper tubing with brass fittings.

Complete and detailed record plans have been prepared, so that the system went into operation with a full record of all underground structures comprising the water works. The record plans also show the details of the construction of the booster pumping station and the piping and appurtenances for the elevated tank.

EDWARD B. ALDRICH,
Chairman, Water Supply Board.

Good Appearance!

an Allis-Chalmers Mark of Quality Performance



Centrifugal Pumps

The Allis-Chalmers line consists of low, moderate, and high head single stage pumps of 1″ to 72″ discharge, multi-stage pumps for working pressure up to 1500 pounds, high efficiency paper stock pumps, and pumps for special applications.

ALLIS-CHALMERS Centrifugal Pumping Units have a fine substantial appearance and it is a reasonable assumption that they will perform as well as they look. When fine appearance and substantial construction are backed up by nearly fifty years experience building Centrifugal Pumps, purchasers can have confidence in these pumps for their requirements. A trial, however, will be the best proof.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

HOWARD A. DILL
Supt., Water Works Corp.
Richmond, Ind.
(Appointed 1899)

A. J. ADAMS
Chief Engr., Water Dept.
Auburn, N. Y.
(Appointed 1924)

WILLIAM R. GELSTON
Supt., Water Dept.
Quincy, Ill.
(Appointed 1907)

WILLIAM H. REICHARD
Supt., Water Bureau
Bethlehem, Pa.
(Appointed 1917)

W. S. WILLIAMS
Supt., Water Dept.
Traverse City, Mich.
(Appointed 1913)

Who's Who in Water Supply

The 47th of a Series of Portraits of Water-Works Officials Which Has Appeared Monthly Since January, 1928

LEO. F. GREWE
Supt., Municipal Light and Water Plants, Huntingburg, Ind.
(Appointed 1917)

GEORGE H. FENKELL
Gen. Mgr., Dept. of Water Supply, Detroit, Mich.
(Appointed 1918)

ROY B. CHAMPION
Supt. of Public Works
Holland, Mich.
(Appointed 1920)

CHARLES B. GILCRIST
Supt., Water Dept.
Newburgh, N. Y.
(Appointed 1907)

CHARLES M. ROOS
Vice-Pres.-Mgr., The Cairo Water Co., Cairo, Ill.
(Appointed 1913)

WILLIAM HENRY COBB
Water Supt.,
Jacksonville, Fla.
(Appointed 1910)

C. C. WILLIAMS
Supt., Water and Light Dept.
Bloomington, Ill.
(Appointed 1925)

E. H. CROFOOT
Mgr., City Water Dept.
Mason City, Iowa
(Appointed 1921)

R. D. HUGGANS
Mgr., Illinois Water Service Co.
Streator, Ill.
(Appointed 1919)

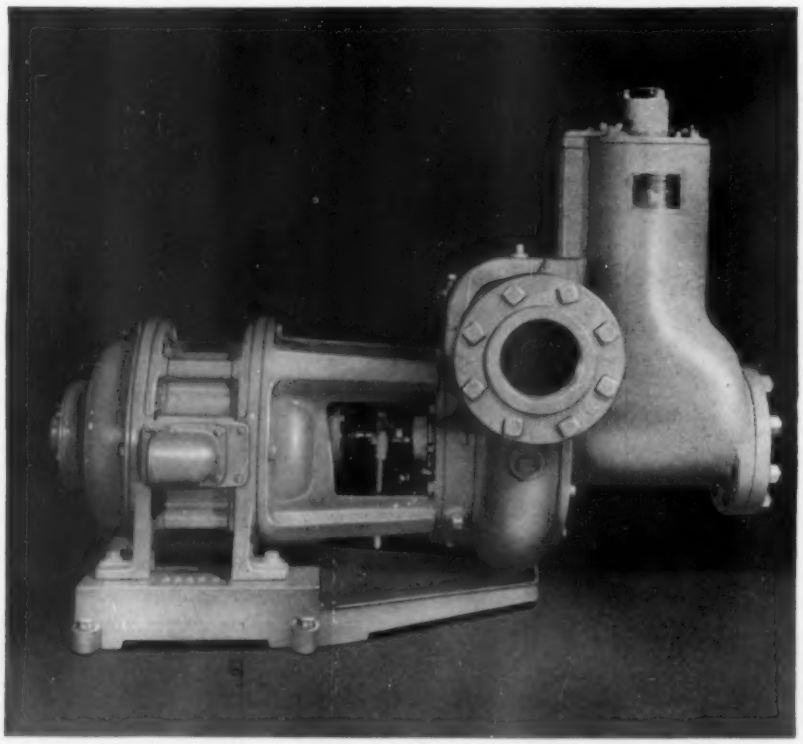
Only this Sewage Pump

has these many convenient features!

REVOLUTIONARY in design, the Jennings Suction Sewage Pump consists of a driving motor and pumping unit, both of standard horizontal pattern. Built into the pumping unit, and mounted on the same shaft with the efficient non-clog centrifugal impeller, is a Nash Hytor Vacuum Pump which provides automatic priming. Unit construction is followed throughout. A sturdy bracket, bolted to the motor housing, supports the pump casing. There is no shaft coupling.

Because of its self-priming feature, the Jennings Suction Sewage Pump is installed outside the receiving pit with only the suction pipe submerged. Here, the pump is always accessible and can be inspected, cleaned or serviced without opening the pit. Having only one stuffing box to take care of and no bearings in the pump casing, the Jennings pump requires little attention. If, for any reason, the impeller must be removed, this job can be done easily and quickly without disturbing packing, bearings or shaft alignment.

Such complete accessibility and ease of servicing are available only in the Jennings Suction Sewage Pump. For full information, write for Bulletin 161.



Jennings Suction Sewage Pumps are furnished in a series of sizes with capacities and heads to meet all the usual requirements.

VACUUM PUMPS AND COMPRESSORS FOR AIR AND GAS ▸ ▸ RETURN LINE AND AIR LINE VACUUM STEAM HEATING PUMPS ▸ ▸ CONDENSATION PUMPS ▸ ▸ FLAT BOX PUMPS ▸ ▸ CENTRIFUGAL PUMPS ▸ ▸ SUCTION (SELF-PRIMING) CENTRIFUGAL PUMPS ▸ ▸ SUMP PUMPS ▸ ▸ SEWAGE PUMPS ▸ ▸ PNEUMATIC SEWAGE EJECTORS

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Jennings Pumps

When you write for that catalog, kindly mention THE AMERICAN CITY

Sewage Treatment Means Clean Streams

Methods and Cost of Cleaning Catch-Basins in Andover, Mass.

ALL cleaning of catch-basins in Andover is done by hand. A total of about 150 basins are cleaned each year at an average cost of 62 cents per basin. Because of the amount of insoluble material removed,—about 12 cubic feet from each of the basins,—the combined organic and mineral matter in the catch-basins and removed by hand is being disposed of on city dumps or given to people nearby for filling low spots and holes.

CHARLES T. GILLIARD,
Superintendent of Public Works.

A Welcome to Visitors

HOW many sewage treatment plants, because of their appearance, attract visitors, and at how many are visitors actually welcome? The sewage treatment plant at Aurora, Ill., is located on a main highway and is ideally situated and designed to appeal to the visitor. It possesses attractive buildings, placed in a setting of natural trees and rolling ground. A well-designed road sign on the highway at the main entrance gives the name of the plant and its ownership, and announces that visitors are welcome. Under the bronze tablet in the main entrance to the buildings is another welcome to visitors.

A group of exhibits, placed on the main pump room floor where plenty of space is available, explains the operation of the plant and instructs visitors. At least 40 people can gather in this place at one time. The make-up of the exhibit can be varied according to the ingenuity and purse of the local plant. At Aurora there is a special picturized framed plan drawing of the plant, 36 x 42 inches, partly in water color, with an explanatory legend naming the various parts of the plant. A table beneath contains three Imhoff cones for typical samples of raw and settled sewage and filter effluent, and also pint-sized glass-stoppered sample bottles for samples of screenings, grit, grease skimmings, digested sludge and dried sludge, all appropriately labeled.

A filter model faced with plate glass, approximately 45 inches wide and 65 inches high and 15 inches deep, made up of the typical underdrain tile, crushed stone, and a filter nozzle and piping, shows the operation of the filters. There is also an illustrated flow diagram of the plant combined with a complete set of pictures to visualize the diagram. This measures 27 x 60 inches, and is framed.

At each part of the plant there is a framed statement explaining the function of the particular portion in considerable detail. Appropriate labels are placed on certain doors, such as those to the clarifier house and furnace room, through which the visitor might hesitate to pass. The plant operators don neat gray work suits for Sunday wear after the general morning clean-up, as Sunday is the day when most people visit the plant. Another distinct feature is the walks for easy and inviting access to the effluent side of the filters at the river, so that the visitor may *see* the final results accomplished by the plant.

The handling of groups of school children requires special technique. School children are the citizens and taxpayers of tomorrow, therefore care and thought should be given to their visits. There should be a short lecture. This gives control of the group by converting it from a lark into a real inspection trip. It lends dignity to the occasion, catches their attention and instructs them in the things they came out to see. The trip through the plant should parallel as closely as possible the route of the sewage flow, in order to avoid confusion in applying the lecture. At several points where the class can be gathered together, a two- or three-minute recapitulation should be given for the benefit of the laggard and backward. This tends to clarify their thinking, holds attention, and creates opportunity for questions.

—Abstract of a paper presented by WALTER A. SPERRY, Superintendent, Aurora, Ill., Sanitary District, at the fourth Annual Meeting of the Central States Sewage Works Association.

Gravel as a Trickling Filter Medium

MANY designing engineers have been inclined to specify crushed stone as a trickling filter medium rather than gravel. The supposition has been that the angularities of the stone would provide more favorable conditions for growth and adhesion of the gelatinous film which is essential to the proper action of a trickling filter. Through the cooperation of the Texas Sand and Gravel Producers Association, the Engineering Experiment Station of the Agricultural and Mechanical College of Texas constructed experimental filter beds to test the efficiency of gravel in comparison with crushed stone.

One bed 15 feet square and 5 feet deep was built. It was divided by a vertical partition into two parts. On one side was placed gravel varying in size from 1-½ to 2-½ inches, and on the other side crushed stone of the same size. The gravel was siliceous and the crushed stone was a rather soft, light-colored limestone. The bed was dosed by means of a single ⅞-inch Taylor circular spray nozzle with a head such that the maximum radius of the spray was 7.5 feet. Since, normally, sprays overlap in a trickling filter installation, the pipe from the dosing chamber to the spray was so arranged that the bed was dosed longer proportionally at the high head than at low head. This, however, was not considered as especially important, since each section of the bed was exactly the same except for filtering media, and only a comparison was required.

The experimental bed was placed in operation January 1, 1930. By January 15 it had accumulated sufficient bacteria to turn out an effluent approximately the same as that of the regular plant, and weekly tests were made thereafter, a total of 57 being made up to February 4, 1931.

The results of these tests, published in Bulletin No. 40 by the Texas Engineering Experiment Station, College Station, Texas, report that the gravel was about as efficient for trickling filters as crushed stone of the same size so far as the character of the effluent is concerned. The unloading characteristics of the two media are also the same. It further suggests in its conclusion that limestone used as a trickling filter medium in climates similar to that where these tests were conducted should be required to withstand ten cycles of the concentrated sodium sulphate test.

Singeing Psychoda

THE famous fly of the trickling filter has met his nemesis in a portable fuel oil torch which singes his wings, body or legs, destroying him effectively. The torch used at Schenectady consists of a 10-gallon oil pressure tank, 15 feet of special oil-resistant pressure hose and an oil-burning torch. A low-grade kerosene or light furnace oil is used in the fuel tank, and the pressure is built up with a hand pump. The pressure tank is supplied with a gage, an air relief valve and a filling cap, together with the take-off union and valve leading to the torch. A temperature of 700 to 800 degrees F. is secured through preheating the coil, which gasifies the fuel and emits an intense, almost invisible flame from the torch. It has a recorded flame temperature of about 2,000 degrees.

When this torch is applied by one or two men to the walls of the concrete filter galleries on which the flies congregate, the flies are very rapidly killed. It has been found that about 2½ gallons of furnace oil is sufficient to furnish flame to singe the flies on 7,200 square feet of vertical walls. This furnace oil costs about 8 cents a gallon in small quantities delivered.

MORRIS M. COHN,
Sanitary Engineer, Department of Public Works, Schenectady, N. Y.

Highway Engineers, Paving Contractors, Water Works Supts . . .

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NOTE

This coming January the HanDeeBox will be shown at the American Road Builders Association Road Show at Detroit.

IF it is necessary for you to have tools and equipment moved often from one place to another, this Bulletin will be of interest to you. It tells about the HanDeeBox, an all-steel tool box that possesses many advantages. Send the coupon, today. Bulletin No. G-6 will be forwarded without any obligation to you.

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Construction and Maintenance

Engineering and Highway Departments

Road Building for Unemployment Relief in Canada

A BROAD program of emergency road building has been adopted by the Canadian Government for unemployment relief. Heads of families are to be given work as near home as possible, but many unattached workers will be sent into the Northwest to labor on the Canadian transcontinental highway.

A current editorial in the *Washington Post* sums up the procedure. Improvements will be in charge of the provincial administrations, as a rule, but the Dominion will render financial aid. In the road camps men will be paid $2.40 a day, from which 80 cents will be deducted for food, and 50 cents a month for hospital service.

Labor enters into every phase of highway work. Every dollar expended for the construction of a surfaced road is divided among labor, aggregates, binder, equipment, and miscellaneous items. Money paid for labor goes for food, clothing, rent and other essentials. The cost of producing aggregates and binder is about 50 per cent for labor, and the remainder is divided among equipment, power, transportation, etc. Money for labor is again distributed to the grocer, clothier, real estate owner, etc. The cost of manufacturing equipment is divided into 40 per cent labor, 40 per cent materials, and 20 per cent power, transportation, etc. Factories are busy furnishing the finished steel, which has been mined as a raw material and made in furnaces. Transportation enters into every field of road building.

Unemployment Relief Through Bridge Construction in Ohio

THE construction of 350 necessary bridges this coming winter at a cost of $3,500,000 is Ohio's answer to the unemployment problem. Governor White's relief bridge-building program will provide work this winter for thousands of Ohio residents and will give the public earlier use of improvements at moderate cost because of present material prices. Bridge construction is particularly suitable during a period of unemployment because labor receives a greater share of the dollar spent for bridge building than for other highway activities in which machinery performs much of the work.

The bridges are all needed, and their construction will save taxpayers' money and provide work for the unemployed. Of the 6,700 bridges on Ohio highways, 1,600 were found to be too light to safely bear the legal traffic load. It is clear that a construction program of 350 bridges can be carried on without questionable expenditures. The program is planned in cooperation with the state relief committee, and a list of unemployed will be furnished the contractor by a committee in each community.

Most of the bridges will be of concrete. Structures on secondary roads which may need to be changed later when modern highways are developed will be of creosoted timber and steel which can be removed and largely salvaged. To insure first-class winter construction, heating of concrete materials will be required and a plant set-up provided that will protect both the concrete and the workman.

O. W. MERRELL,
Director of Highways, Ohio State Highway Department.

Highway Construction and Unemployment

ACCORDING to a report from the American Road Builders' Association, over two billion dollars is held to be the minimum sum necessary to preserve normal activity in the construction of streets and highways in 1932, without considering extra construction to relieve unemployment. Motor-vehicle taxes alone will produce half this sum. The relief of unemployment should be effected through additional funds made available from Federal, state, county and city sources. The effectiveness of road and street construction for unemployment relief has been accepted by cities and counties in previous emergencies and construction campaigns inaugurated for relief. The Federal Government and the states tested the use of road construction to give men work during the emergency, and practically all of the money appropriated was expended by September 1.

More than a million men are now employed in street and highway building, and it is estimated that two men are busy furnishing material, equipment and supplies for each man working on the highway. Federal aid and state road construction during 1931 exceeded a billion dollars, and employed 350,000 men, and county and township road work required in excess of two-thirds of a billion in 1931. Probably because of its diversified character, paving keeps as many men busy as any other one activity.

According to W. R. Smith, President of the American Road Builders' Association, and also President of The Lane Construction Co., highway constructors, Meriden, Conn.: "Analysis of the dollar spent on road and street work shows that more than 75 per cent of the money expended on highways ultimately goes to labor. Labor, equipment, fuel and secondary materials are used in the preparation of road and street materials. In turn, the secondary materials employ labor in their manufacture. Highway work is the largest market for cement, sand, gravel, crushed stone, vitrified brick, asphalt and tar. Steel has a wide variety of uses. Railroad freight tonnage of highway products is a considerable item.

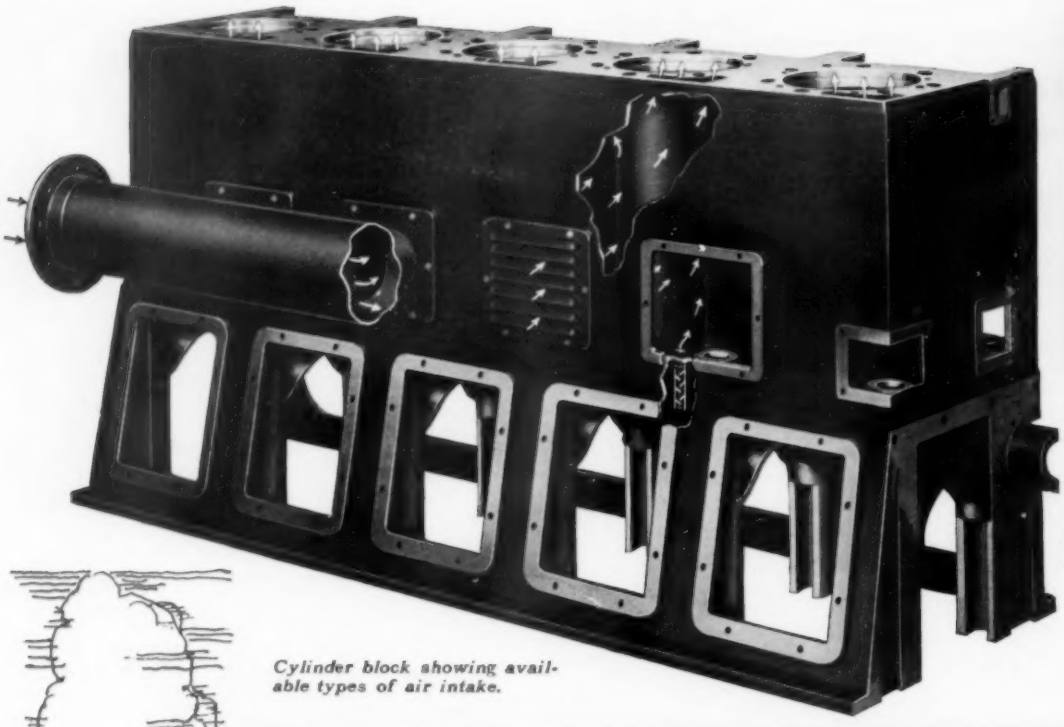
"Unemployment relief depends largely on the initiative of local leaders, many of whom are advocating road and street building. The results from money spent on good roads in a time of emergency such as the present remain long after the depression is forgotten. A man out of a job needs it where he lives. Highway work brings the job to the worker."

Road Building Sets Record for Employment

IN the annual report of W. C. Markham, Executive Secretary of the American Association of State Highway Officials, it is interesting to observe the difference in attitude of the average taxpayer toward the number of people employed in state highway work. Mr. Markham says: "We have always been taught to measure road improvements by the yard. This year we are asked to reckon them by heart beats. It seems but yesterday when state highway departments feared to let it be known how many people got their bread and butter from jobs on the state highways. Now they are importuned on every hand to hire more men. The Federal Government is capitalizing the information as to how many people have a livelihood because of increased Federal appropriations for highways, and the states have, many of them for the first time, found that not only the state departments but the contractors have a great army of workers on the roads whose pay envelopes were a vital matter to many a household.

"On the first day of July, 1931, there was one person employed on state highway work for every 369 people in the nation. The largest number employed in any state at that time was one out of every 70 persons, in the state of Maine. This has not reckoned those persons employed in road work by townships, counties or cities, neither does it have anything to do with persons who are employed exclusively in preparing materials to be used in road construction. Likewise this has no reference to people employed by the Federal Government in road work, whether departmental, in forests, Indian reservations, public domain or National Parks.

"In addition to all this, the fact should not be overlooked that there are many industries scattered throughout the country which would have been closed down if it had not been for the demands made upon them to furnish materials for this road-building program."



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Cylinder block showing available types of air intake.

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Increased strength without added weight . . . closer cylinder grouping with greater cooling area . . . reduction in number of parts and elimination of bolted joints . . . use of removable cylinder liners . . . cast-in air intake and air starting manifolds which obviate the use of exterior piping—all are incorporated in Superior Diesel Engine Cylinder Blocks.

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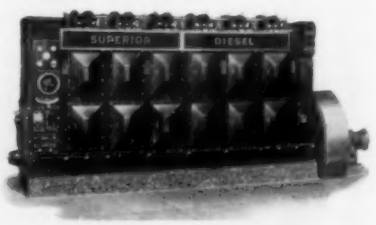

FRANK E. WATERMAN
Comsr. of Public Works
Providence, R. I.

H. A. RIEGER
City Engineer
Albion, Mich.

ANN E. MURPHY
Asst. Supt. of Streets
Chicago, Ill.

DR. WM. SCHOEDER, Jr.
Chairman, Sanitary Commission
New York

H. D. BRADLEY
Deputy Street Comsr.
Toronto, Ont.

Who's Who among Sanitation Officials

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

E. A. WOOD
Chief, Street Cleaning Division,
Dept. of Health, Winnipeg, Man.

M. B. HERLONG
City Comsr.
Jacksonville, Fla.

GEORGE E. CAVANAUGH
Supt. of Accounts and Finance
Allentown, Pa.

DONALD C. STONE
Director, National Committee on
Municipal Standards, Chicago, Ill.

H. O. GUNDERSON
Comsr. of Health
Rockford, Ill.

CHARLES S. HAND
Comsr., Div. of Street Cleaning
and Waste Disposal, New York

THOMAS L. COSTIGAN
Supt., Street Cleaning
Washington, D. C.

TIM. B. BUCKLEY
Supt. of Garbage
Minneapolis, Minn.

WILLIAM COLQUHOUN
Comsr., Public Works
Yonkers, N. Y.

Greetings

from

American Steel & Wire Company

Again the Yuletide, with its inspirations of good cheer is with us—the New Year approaches—and we sincerely extend to you our very best wishes for a very

MERRY CHRISTMAS and a
HAPPY, PROSPEROUS
NINETEEN THIRTY-TWO

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During December we hope you will remember to mention THE AMERICAN CITY

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Refuse Collection and Disposal an Engineering Problem

BULLETIN No. 13, "An Outline of the Municipal Refuse Problem," published by the Division of Municipal and Industrial Research of the Massachusetts Institute of Technology, makes the following statement, with which, we regret to say, many sanitary engineers and other municipal officials have not agreed:

"It should be recognized at once that the collection and disposal of municipal refuse is essentially an engineering problem and should therefore be placed under the direction of the municipal engineering or public works authorities rather than under the health officer. The technical features involved are of sufficient importance, especially in larger communities, to require the services of a trained engineer and the organization of a specific division or department of the municipal government. If attached to the health department, the collection and disposal of refuse serves only to distract the health authorities from their proper function of preventing or controlling disease, nor does it in this case always receive the technical study essential for satisfactory results."

Irvington Triples Incinerator Capacity

ON November 7, 1931, Irvington, N. J., opened for test and inspection its new $151,000 major addition to the municipal incinerating plant. The addition doubles the plant in size and increases its capacity three times. No storage space was provided in the old plant, but the new plant is so arranged that trucks can drop their loads directly into the furnaces or into a ventilated storage bin from which the garbage and rubbish are transferred by a traveling crane and bucket to the furnaces. The trucks will move continuously and there will be no waiting, which, it is expected, will save about $10,000 annually.

The new plant is so designed that it can be run 24 hours daily without altering the present 8-hour collection period, and it is anticipated that the plant will be large enough to serve Irvington for at least 25 years. The new furnace is of the Nye circular type, 16 feet in diameter. It is expected that the new furnace will handle the bulk of materials and the old water-jacketed furnace will be held as a reserve unit and for heating purposes.

Changes in method of collection have also been planned for in the design of the plant, and should the collection equipment be changed to demountable bodies in the future, the present storage bin can be changed to a drive entrance and the bodies lifted from the trucks from the loading floor by the crane. A feature of the addition is a long ramp from the street to the plant, which will facilitate rapid unloading of the trucks.

HERBERT KRUTTSCHNITT,
Director, Department of Public Works.

Bessemer, Ala.

Garbage collection is handled entirely by the city of Bessemer, population 20,721, using six one-horse and one two-horse wagon and two one-ton motor trucks. About 60 per cent of the garbage is incinerated and 40 per cent is used to fill low lands.—L. J. DE SABLA.

Brewton, Ala.

Garbage in Brewton is collected by a contractor, who is paid by the city. One truck is sufficient to collect garbage in this city of 2,818 population. This household refuse is disposed of by dumping one mile from the city limits.—C. S. OVERSTREET, Chairman, Street Committee.

Fairfield, Ala.

Two one-horse wagons, a 2½-ton truck and a 1½-ton truck of 3½ and 2 cubic yards capacity respectively are used in the city of Fairfield, population 11,059, for the collection of garbage by the city. An open dump is maintained where all garbage is burned.—J. T. DUNCAN, Sanitary Inspector, Street Department.

Tucson, Ariz.

The city of Tucson, population 32,506, collects all of the garbage, using one 15-cubic yard, one 10-yard, one 6-yard, two 5-yard and one 4-yard motor truck. The garbage is collected three times a week and is disposed of by incineration.—GEORGE W. SEELEY, Commissioner of Streets.

Glendale, Calif.

Garbage is collected in Glendale, population 62,736, by a contractor paid by the city. He uses three 2½-ton motor trucks, each truck carrying two steel tanks, into which the garbage is emptied from the individual household containers. The garbage is disposed of by feeding to hogs.—J. C. ALBERS, City Engineer and Superintendent of Streets.

Monrovia, Calif.

A contractor paid by the city collects the garbage in Monrovia, population 10,890, using three motor trucks, one 2½-ton and two 1½-ton. The garbage is hauled to rural districts, where it is disposed of by feeding to hogs.—G. H. DUELL, City Engineer.

Orange, Calif.

The city of Orange, population 8,066, pays a contractor to collect garbage throughout the city. The contractor uses two Ford trucks of 1½-ton capacity with bodies capable of holding 360 cubic feet. The garbage is disposed of by hauling to farms, where it is fed to pigs.—C. C. BONEBRAKE, City Engineer.

Pasadena, Calif.

The city of Pasadena, population 76,086, collects all residential garbage and garbage from hotels and restaurants by city-owned trucks, using a total of eight 2½-ton trucks with 4-yard bodies. The garbage is disposed of by feeding to hogs.—J. E. MCDOWELL, Superintendent of Refuse Department.

Pomona, Calif.

The city of Pomona, population 20,804, collects the garbage with one municipally owned 4-yard capacity truck. The garbage is disposed of by feeding to hogs.—F. C. FROEHDE, City Engineer.

San Diego, Calif.

All garbage in San Diego, population 147,995, is collected by the city, using ten motor trucks of 2-, 3-, and 5-ton capacity. The garbage is disposed of by feeding to hogs. The city has a contract with a reduction company for the disposing of garbage as dry feed for poultry and hogs.—R. M. GREGORY, Manager of Operation.

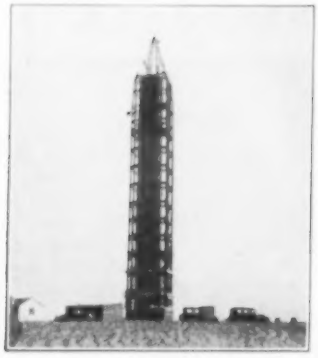
Trinidad, Colo.

All garbage in Trinidad, population 11,732, is collected by one man, who uses the garbage for hog feed. The city does not pay the collector for this service, his entire remuneration being the income derived from the sale of hogs.—JAMES INGLES, City Clerk.

Daytona Beach, Fla.

The city of Daytona Beach, population 16,598, collects all garbage throughout the city with six municipally owned 2-ton Mack trucks with 12 x 6 x 3-foot bodies. The garbage is disposed of by burning in a Nye odorless incinerator. About 231 tons of garbage are collected per week in summer, and 291 tons a week in winter, when the population increases with the annual influx from the North.—E. L. REES, Superintendent of Public Works.

Long Island's State Park Stores Water at Jones Beach in a "Pittsburgh-Des Moines" Tower

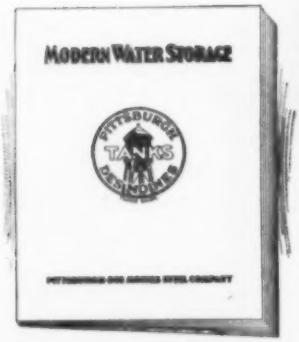


The Long Island State Park Commission is conducting an experiment in civic beauty and cleanliness at Jones Beach—an interesting resort near Long Beach on the south shore. Park grounds, walks, beaches, and even the highways are maintained free from the usual litter, trash and picnic refuse of a metropolitan beach resort by vigilant policing—and the public's willing cooperation.

One of the primary essentials was plenty of good, clean water in a quality holder. "Pittsburgh-Des Moines" was called upon for the erection of a 300,000-gallon steel standpipe, shown under construction at the left above, and shown completed (with its ornamental masonry) in the center. This architecturally pleasing tower has a diameter of 19 feet; a height of 150 feet.

At the right is shown a 750,000-gallon elevated tank, 100 feet high to capacity, also erected the past summer by "Pittsburgh-Des Moines" to supply water at adequate pressures to the neighboring city of Long Beach.

There are thirty-eight years of municipal contracting experience back of every "Pittsburgh-Des Moines" job. What are your water supply problems?



Interested municipal officials write to the nearest office for a copy of our new 28-page catalog, "Modern Water Storage." It gives interesting photographs, engineering data, and standard specifications on "Pittsburgh-Des Moines" tanks, steel pipe, and water systems.

Pittsburgh-Des Moines Steel Company

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"Keep Your Streets Clean"

Items on Street Cleaning and Snow Removal

Cost of Sweeper and Flusher Operation in Ann Arbor

ANN ARBOR finds that the cleaning of its paved streets is getting to be more of a problem every day and that the most modern machinery must be used to keep down the cost. In figuring the cost, the Street Department aims to charge up every item, with the exception of the depreciation of the machinery.

The city has about 36 miles of paved streets, which are cleaned with one pick-up sweeper and one 1,500-gallon flusher. No white wings are employed, but men are sent around to clean up the intersections where paved streets run into dirt streets.

The following costs of cleaning paved streets are taken from the last report of the Department:

PICK-UP SWEEPER OPERATION

Sweeper operator	$1,179.70
Sweeper maintenance	966.95
Gas, 1,668 gallons	259.92
Oil, 113 quarts	20.34
Making broom and material	806.21
Gutter broom and material	179.18
Hauling sweepings	863.36
Hand cleaning of pavement-ends	210.17
Spring clean-up	666.96
Picking up and hauling leaves	756.33
Cleaning paved alleys	102.12
	$6,011.24
Inventory of broom fiber left	314.00
Total cost of cleaning paved streets	$5,697.24

FLUSHER OPERATION

Flusher operator	$930.00
Gasoline	439.89
Oil	45.54
Maintenance	624.74
Water used	478.33
Total cost of flushing	$2,518.50
Total cost of sweeping and flushing	$8,215.74

The cost of maintenance may seem rather high, until it is explained that the Department requires the sweeper and flusher operators to wash, clean and oil their machines every day and this time is charged to maintenance. The sweeper is operated from 3 A.M. until noon. The business section is swept every day, and the residence section two or three times per week.

A. J. PAUL,
Street Commissioner.

Sweeping in Oak Park

ALL paved streets in Oak Park, Ill., were cleaned once a week in the residential districts from March 1 to December 1, 1930. In the business districts the streets were cleaned every other day. Approximately 5,186 miles of streets were cleaned with a motor pick-up sweeper, and about 3,543 miles were cleaned by hand. The 5 miles of streets in the business district were cleaned daily by a combination of motor sweeper and hand sweeping.

All leaves and sweepings from street and alley pavements were hauled to the dump at Summit up to July 15, when the incinerator was put into use. From that time on, leaves were burned at the incinerator and street sweepings were hauled to the dump.

About 12,714 cubic yards of dirt and leaves were removed at an average cost of $1,763 per cubic yard, and 8,729 gutter-miles of streets were cleaned at an average cost of $2.566 per gutter-mile. Estimating the average width cleaned as 18 feet, the total number of square yards swept was 46,089,120, at an average cost of $0.000486 per square yard.

Street cleaning expenditures for 1930 were as follows:

Labor	$16,765.45
Superintendence	758.20
Teams and trucks	1,453.06
Hired teams and trucks	1,086.50
Maintenance of sweeper	1,577.96
Miscellaneous supplies and equipment	279.66
District cleaning	492.20
	$22,413.03

DUDLEY C. MEYERS,
Commissioner of Public Works.

Beverly Hills Sweeps 22 Miles

RUBBISH and garbage collection and disposal and street cleaning in Beverly Hills, Calif., are all under the City Engineering Department. Beverly Hills is entirely a residential city, with an unusually large number of fine homes and estates with extensive grounds.

The city's mechanical sweeper, with one-man operation, covers approximately 22 miles each night and sweeps the entire 90 miles of streets every ten days, and the main boulevards twice each week.

Some of the principal thoroughfares are so wide that not only are the curb areas on both sides of the street swept, but also, in order to maintain a spic and span appearance, the center areas are covered. The principal thoroughfares are swept twice each week with the machine. In addition, one hand sweeper operates full time in the business district and another full-time man patrols around the schools.

WILLIAM R. METZ,
City Engineer.

THREE HVASS FLUSHERS IN FRONT OF THE MUNICIPAL GARAGE AT ALBANY, N. Y.
Reading from left to right, these flushers are 1924, 1930 and 1928 models, and they are all in very good working order

"A Box a Block"

GIVES STATESVILLE, N. C.

96%

BOX ALARMS

CITY OF STATESVILLE
STATESVILLE, N. C.

J. H. MILLS
CITY CLERK AND TREASURER

September 21, 1931.

The Gamewell Company,
Newton, Massachusetts.

Gentlemen,-

It is a pleasure to hand you a statement in regard to our Gamewell Fire Alarm System, which as you know is a "Box in every Block" in our city. We have 100 boxes in our city which has a population of ten thousand four hundred ninety one (10,491). Will say we have in the past 12 months had 103 alarms, of these alarms ninety six (96) % came in over the system.

We are more than pleased with the Gamewell System, and would not think of going back to the old system of telephones. It might be interesting for you to know that our fire area is approximately thirty nine hundred acres.

Yours very truly,

A. Cooper

A. Cooper
CHAIRMAN OF FIRE COM.

Statesville, N. C., offers another fine example of what adequate fire alarm box distribution will do for a fire department. Three years ago when that city installed its first fire alarm system, the officials decided that if they were to receive the full benefit from their investment, an adequate number of fire alarm boxes would have to be installed.

Accordingly, it was decided to install a box on every block so that a person discovering a fire would know instantly that a box could be found on the nearest street corner. One hundred Gamewell boxes of the Peerless non-interfering and succession type were distributed throughout this city of 10,491 population. Now that the system has been installed long enough to judge its value, Chairman of the Fire Committee Mr. A. Cooper, states that the city has received 96 per cent of its alarms through the fire alarm boxes during a twelve months' period, and although definite statistics are not available, there has been a noticeable decrease in fire losses.

Examine the fire alarm records of your own city. If the percentage of box alarms is low, it is an indication that you have not a sufficient number of fire alarm boxes. Additional boxes should be installed until you have "A Box A Block" distribution, then as your city grows, a definite number of new boxes should be installed each year to maintain an adequate box distribution. Without that, you cannot maintain a high percentage of box alarms—the safe alarms.

The fire alarm box offers you the quickest and most reliable means of transmitting an alarm of fire.

THE GAMEWELL COMPANY

NEWTON, MASSACHUSETTS

"A Box A Block"

Police—Fire—Safety Items

of Interest to Departments of Public Safety

How the Federal Government Assists Police Departments

"POLICE officials . . . find the increasingly indispensable cooperation of the National Government concentrated mainly in two departments," states Paul V. Betters in the Summary of his valuable monograph on "Federal Services to Municipal Governments." * "The Bureau of Standards not only provides model traffic and safety codes, technical information on traffic signs and signals and scientific brake-testing and motor-vehicle headlight standards, but it will cooperate with police departments in making criminal identifications and in installing systems of short-wave radio communication between headquarters and patrolling automobiles.

"In the Department of Justice the Bureau of Prohibition is of course ready to cooperate with local officers in enforcing the National Prohibition Act. The Bureau of Investigation is peculiarly a co-operating agency, drawing on local law enforcement officers for information and in turn making this information generally available. It invites all peace officers, for example, to use its fingerprint records, believed to be the largest and most complete collection of current value existing anywhere in the world. Since September 1, 1930, moreover, the National Division of Identification and Information of this Bureau has undertaken the collection of national crime statistics on a uniform basis and issues a monthly bulletin known as 'Uniform Crime Reports' which is supplied to cooperating municipal police departments free of charge."

The Fire Hazard of Electrical Wiring and Equipment

"PRACTICALLY all of the hazards of electrical wiring and equipment arise from the use and abuse of worn flexible cords, old and worn-out switches and lamp sockets, damaged or defective portable appliances, careless maintenance, and bridged fuses," declared C. S. Graham, City Electrical Inspector, Jacksonville, Fla., in a radio talk over Station WJAX, Jacksonville, during National Fire Prevention Week. With proper care, and inspection, said Mr. Graham, fire losses from electrical causes can be kept at a minimum, but without a constant and ceaseless campaign against defective and hazardous electrical wiring and equipment, property and lives may be endangered.

"The fuse is the safety valve of the electrical installation. If you have good fuses of the proper size protecting your circuits, they will melt, or 'blow,' in the event of any trouble such as 'grounds,' 'short-circuits' or 'over-loads.' By melting and opening the circuit they will protect your wiring from damage and consequent hazard. Unfortunately, fuses are not fool-proof, and, alas, too many ignorant consumers have learned how to 'bridge' or 'jump' them, with pennies, tinfoil, pieces of wire, or other metal substances. When the fuse is bridged, the safety of the installation is destroyed."

Fuses of the proper size will not blow unless there is something wrong in the circuit which causes the current to "build up" to a volume greater than the wiring can safely carry. Different sizes of fuses should be used for different sizes of wiring, the size of the fuse being based upon the safe carrying capacity of the wire with which it is in circuit. "When a fuse of the right size blows," warned Mr. Graham, "replace it *at once* with another of the same size; the original fuse may have been defective or have blown from a brief or intermittent overload. If the second one blows, stop right there and call in an experienced electrician to locate and correct the trouble. Do not bridge the fuse under any circumstances if you have any respect at all for the element of safety to life and property."

A number of the leading manufacturers of electrical equipment, he said, have developed and placed on the market during the past two or three years a complete line of fool-proof, non-tamperable, automatic circuit-breakers intended to take the place of fuses. They offer practically 100 per cent protection to the wiring which is in the circuit and are available at a moderate cost through any reputable distributor of electrical supplies, but they cost more than the common fuse-block and fuses and are consequently not so generally used. "Electrical inspectors will breathe easier and sleep better at night when the day arrives when fuses will be as obsolete as the kerosene lamp and their place is occupied by approved, automatic circuit-breakers."

Mr. Graham pleaded for attention to worn and frayed portable cords and advised that flexible cords be avoided in favor of fixed wiring whenever possible. Worn and frayed cords and worn and broken plugs should be replaced. Lighting fixtures torn loose from their supports by careless handling should be repaired. Live wires of a circuit from which sockets, switches or fixtures have been removed must not be brought into contact with each other, or a short-circuit will result. "Something must give way and if there is not a proper fuse in circuit to melt and cut off the current, then the wires will melt or burn in two and the fireworks will start."

* See department of Municipal and Civic Publications in this issue.

A Model Bonfire Ordinance

AN ordinance regulating the burning of refuse in cities and villages has just been completed by the New York State Bureau of Municipal Information, as follows:

Section 1.— *Fire in Public Places and Vacant Lots.*—It shall be unlawful for any person or persons to burn or cause to be burned any trash, lumber, leaves, paper, straw, brush, grass or any other combustible material of any kind, or to kindle a fire, or to furnish material for a fire, or in any way to authorize or allow any fire to be made or in any manner to aid or assist in making any fire in any street, alley or other public place, or on any dock or wharf, or on any vacant lot in the city (village) of ————, without first having obtained and having in full force and effect written permission to do so from the ————. No permit shall be issued to kindle, build, maintain or use a fire within 15 feet of a fire hydrant, or within 2 feet of any concrete curb or the surface of any permanent pavement, except for the purpose of repairing, removing or constructing the same. A fire kindled, built and maintained under a permit as herein provided shall be continuously under the care and direction of a competent adult from the time it is kindled until it is extinguished. Such burning shall be done under such other proper safeguards as the ———— may prescribe.

Section 2.—*Fire on Other Private Property.*—It shall be unlawful for any person or persons to burn or cause to be burned out of doors any hay, straw, shavings, paper, leaves, trash or any other combustible material on any occupied lot within the limits of the city (village) of ———— except in wire baskets or other fireproof receptacles with proper cover.

Section 3.—*Penalty.*—Any person who himself, or itself, or by his or its agent or employee, violates any of the provisions of this ordinance shall, upon conviction thereof, be subject to a fine of not less than $——— or more than $———, or by imprisonment for not less than ——— or more than———, or to both such fine and imprisonment.

Section 4.—All ordinances or parts of ordinances in conflict with the provisions of this ordinance are hereby repealed.

Section 5.—This ordinance shall take effect ————.

"One-Eyed" Cars in New Jersey

A RECENT survey made by the New Jersey Traffic Commission showed that from 2.2 to 3.7 per cent of the cars were "one-eyed." One-quarter of a million vehicles were checked from 8 P.M. to 12 midnight at 24 representative intersections.

During a three months' period ending in June, 103 accidents involved vehicles having defective headlights.

An analysis of commercial vehicles indicated that the tail lights and body lights were in the following conditions: 10 per cent were good, 72.5 per cent were fair, and 17.5 per cent were bad. Of the 636 commercial vehicles checked, 58 had tail lights out and 75 had an oil lantern as a rear light.

In the Wake of THE KILLER

MOTORCYCLE POLICE prove best safeguard

Study the facts set forth in our much-talked-of brochure, "The Bloodiest Page in American History". It tells how the growing menace of dangerous motoring is successfully combatted. And it will give you the data you need on the Harley-Davidson Police Motorcycle. Send postal for free copy.

RECKLESS DRIVING — with Death at the wheel — leaves a bloody welter of dead, dying, and crippled victims in its wake.

It kills three times as many citizens as all gunmen and other criminals put together — kills as many Americans in a year's time as the World War did!

The Killer — Reckless Driving — roars its devastating way through all communities, almost unchecked — *save in those cities that are patrolled by adequate squads of motorcycle police.*

Are *your* citizens safeguarded by swift Riders of the Law on Harley-Davidson Motorcycles? It is significant that cities with superior safety records are so protected.

HARLEY-DAVIDSON MOTOR COMPANY
Dept. M Milwaukee, Wisconsin

HARLEY-DAVIDSON

The Police Motorcycle

DON LEGG
Police Chief, Alexandria, La.
(Appointed 1922)

ARTHUR H. GABBERT
Police Chief, Oshkosh, Wis.
(Appointed 1922)

JOHN J. McBRIDE
Police Chief, Cambridge, Mass.
(Appointed 1918)

JOHN P. MURPHY
Police Chief, Summit, N. J.
(Appointed 1922)

CHARLES A. McGINLEY
Fire Chief, East Orange, N. J.
(Appointed 1927)

Who's Who in Public Safety

The 46th of a Series of Portraits of Fire and Police Chiefs Which Has Appeared Monthly Since January, 1928

J. G. LAUBENHEIMER
Police Chief, Milwaukee, Wis.
(Appointed 1921)

R. M. TAPPIN
Fire Chief, Gardner, Mass.
(Appointed 1927)

A. E. BUCHANAN
Police Chief, Superior, Wis.
(Appointed 1922)

PHILIP T. BELL
Police Chief, Kearny, N. J.
(Appointed 1924)

JOHN GILDAY
Fire Chief, Hoboken, N. J.
(Appointed 1918)

WILLIAM F. O'NEILL
Fire Chief, Weehawken, N. J.
(Appointed 1926)

C. C. PIGMAN
Fire Chief, Marshalltown, Iowa
(Appointed 1919)

JETHRO GIBBS
Fire Chief, Montclair, N. J.
(Appointed 1923)

J. L. LUCIER
Fire Chief, Northhampton, Mass.
(Appointed 1928)

FOR 1932 INSTALLATIONS AND REPLACEMENTS

Choose ARMCO PAVED INVERT Storm Sewers

Nature-Tested! Nature-Proved!

City after city is "discovering" Armco Paved Invert Pipe as the better product, in every way, for storm sewers.

And well they may, for, basically, Armco Paved Invert Pipe is Armco Corrugated Pure Iron Pipe with an unequaled 25-year record for steady, increasing, storm sewer service. *The added advantage is this:* The invert is paved with a bituminous pavement which effectively withstands erosive hydraulic traffic —sand, silt, stones, and boulders.

Enclosing an open ditch with a 48-inch Armco Paved Invert Storm Sewer at Kenilworth, Illinois

Engineers knew it was right. Years of tests in field and laboratory proved the pavement was right. But it was left to Nature to give it the final test and Nature has. Years of actual service in the ground have proved the true worth of Armco Paved Invert Pipe. Its great and economical adaptability for storm sewers now stands unquestioned.

Like other Armco drainage products, it is easily hauled at small costs, without breakage, and requires no expensive equipment to install.

To date, more than 2,500,000 feet of Armco Paved Invert Pipe is in use. 1932 will witness thousands of new installations as an adequate solution to modern-day storm sewer problems in cities.

Facts which are responsible for the big swing to Armco Paved Invert storm sewers are assembled in booklet form. This is yours for the asking. Clip and mail the coupon today.

Armco culverts and drains are manufactured from the Armco Ingot Iron of the American Rolling Mill and always bear its brand.

ARMCO CULVERT MANUFACTURERS ASSOCIATION, *Middletown, Ohio*

Mail the Coupon

Gentlemen: Send me new booklet of facts on Storm Sewers of Armco Paved Invert Pipe.

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Name .....

Address .....

AC 12

The Pipe That Knows No Season

Keep men at work this winter installing Armco Corrugated Pipe for culverts, bridge replacements, and for storm sewers.

DECEMBER, 1931

Vol. XLV, No. 6

The American City

470 Fourth Avenue
New York

50 Cents, $4 a Year

Successful Municipal Ownership in Huntingburg, Ind.

By GEORGE RANDALL McCORMACK

IN view of the widespread demand for economy in city expenditure and with so many municipalities facing a serious shortage of funds, while others are galling under the exactions of franchises carelessly granted in balmier days, the little city of Huntingburg (1930 population, 3,440), in Dubois County, Ind., offers a striking contrast to the general state of affairs.

To find a better example of what successful and unselfish municipal administration has accomplished for a community would indeed be difficult, for not only is the city of Huntingburg free from debt, with a tidy sum on deposit and a city tax rate of only 95c on $100, but, furthermore, Huntingburg does not need to worry over public service franchises, as the city owns its utilities and supplies its citizens and its neighbors as well with heat, power, light, and water; does it as efficiently as most private corporations and, despite all usual generalizations to the contrary, is making money in doing so.

The reasons underlying the city's extraordinary success in her municipal enterprises are not difficult to find. Huntingburg originally was largely a German settlement, and the traits of thrift, business enterprise, and community spirit so characteristic of the German-American have not been entirely erased in a period of one hundred years. Then, too, in the management of the city's utilities politics has not been permitted to interfere; ability and efficiency have been the requirements demanded of the superintendent of the city's light and water plants, and the business-like management of those utilities has meant prosperity for the city.

It is not surprising that the citizens of Huntingburg whose grandparents built their own flour mills, potteries, brick and tan yards, and who hauled in with ox teams the first steam boiler in that part of the state, should scoff at the idea of having electricity and water furnished them by outside interests. Consequently, they early formed local private companies which for many years supplied the town with light and water.

In 1892 the city purchased the water company, and in 1915 bought the light company's holdings, the purchase price being $21,000. Almost immediately a new and entirely modern light and power plant was constructed, and in December, 1917, Leo F. Grewe was appointed superintendent of both the water and light plants. Mr. Grewe's appointment marks the beginning of the real success of the city's experiment and as he has held the office continuously under both democratic and republican administrations, a great deal of credit is due to his ability as well as to those with political power who unselfishly recognized that ability.

The Water Supply

The water supply for the city is derived from three large artificial lakes about 1½ miles west of the city. These lakes, covering approximately 165 acres, have an average depth of 15 feet and are surrounded by a watershed of about 1,500 acres. The water is soft, free from contamination, and unexcelled in taste and purity.

Since the construction of a new lake in 1927, the water supply is practically inexhaustible under ordinary conditions, and during the recent drought train loads of water were sent to many points along the Southern Railway. The city also furnished farmers with water for live stock.

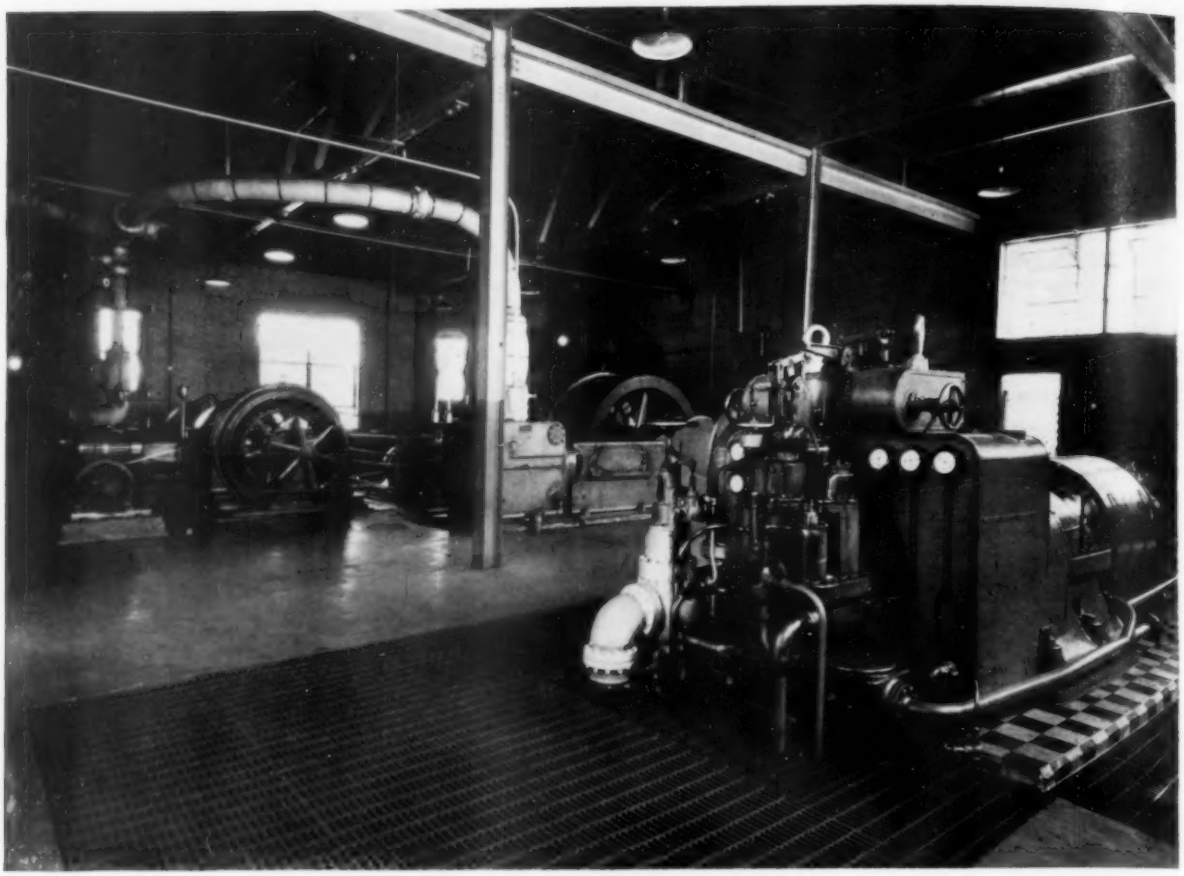
The city water supply is pumped into two large reservoirs by electric pumps controlled from the city power plant. These reservoirs are situated on a high hill overlooking the city and provide a minimum gravity pressure of 68 pounds at all points along the city street mains.

The Southern Railway is the city's best water customer and pays the city approximately $5,000 annually for the water used, at the exceedingly low rate of 6c per 1,000 gallons.

The minimum residential charge for water is 50c per month. The minimum rate for industrial purposes is graduated from 50c to $20, depending on the size of the meter and the amount of water used.

The Power Plant

The city's electrical power plant is as attractive and modern as any plant of its size in the country; being equipped with condensers, ash conveyors, stokers, and all available labor-saving devices. The generator room is a model of efficiency in arrangement, and contains four



GENERATOR ROOM OF THE HUNTINGBURG PLANT
A model of efficient arrangement. The new turbo-generator is shown at the right

generators with a combined normal capacity of 1,385 kw. A new steam-driven turbo-generator is the pride of the plant and is so perfectly installed that, despite its enormous weight and a speed of 3,600 r.p.m., it scarcely causes noticeable vibration.

Included in the equipment are a 750-kw. Westinghouse turbine, a 640-hp. steam engine direct-connected to a 360-kw. G-E generator, a 225-hp. Skinner engine direct-connected to a 125-kw. G-E generator, and a 275-hp. Skinner engine belted to a 175-kw. Westinghouse generator. All these machines are equipped with exciters and Westinghouse switchboards. The boiler equipment includes an 84 x 20 and two 72 x 18 boilers, the first of which is equipped with a Westinghouse stoker, the other two being hand-fired. The boiler feed pumps include one 7½ x 7½ x 10 Fairbanks-Morse pump and one 5½ x 5½ x 6 Dean pump. The new equipment recently installed includes a 361-hp. water tube boiler made by the Henry Vogt Machine Co., of Louisville, Ky., and a 165 x 6½ chimney, built by J. M. Cutshall & Son, of Brazil, Ind. About $55,000 was spent on the new equipment.

Besides supplying Huntingburg with power and light, the city's plant also furnishes the city of Ferdinand with electricity, and just recently a power line was extended into the rural district which serves an ever increasing number of farm homes.

The minimum charge for commercial lighting is 75c per month. For power, the rate is 5c for the first 200 kwh., and decreases proportionately until at 2,000 kwh. the low level of 2c is reached. For cooking the rate is 3c per kwh., with a minimum charge of $2.25 monthly.

These low power and water rates have proved a great stimulus to business, and it is doubtful that there is a city in the state of similar size using more electrically operated household utilities. Likewise, the local factories and plants are using electric motive power in ever increasing quantities. The city owns all light and water meters, and any customer may on request have his meter tested free of charge once each year.

The Facts in Figures

Superintendent Grewe and the citizens of Huntingburg are justly proud of the record the city has made in the operation of its utilities, but the true significance of their accomplishment is made more apparent when records are examined and cold facts presented.

When the city purchased the light plant, in 1915, the valuation was $21,000. In 1930 the valuation of the light plant was $192,654.50, and that of the water plant was fixed at $176,478. Since 1915 the city has transferred approximately $175,000 from the earnings of the light plant to the general fund for use in city improvement.

In 1930 the light plant earned a net profit of $31,000, and the water plant earned $8,840.47. These figures, however, do not represent the entire earnings, for the city has never charged itself with street light or hydrant rent, and these are items that run high in municipal operating expenses.

Highway Construction by Convict Labor

Administration and Costs in Alabama

By C. W. COOPER

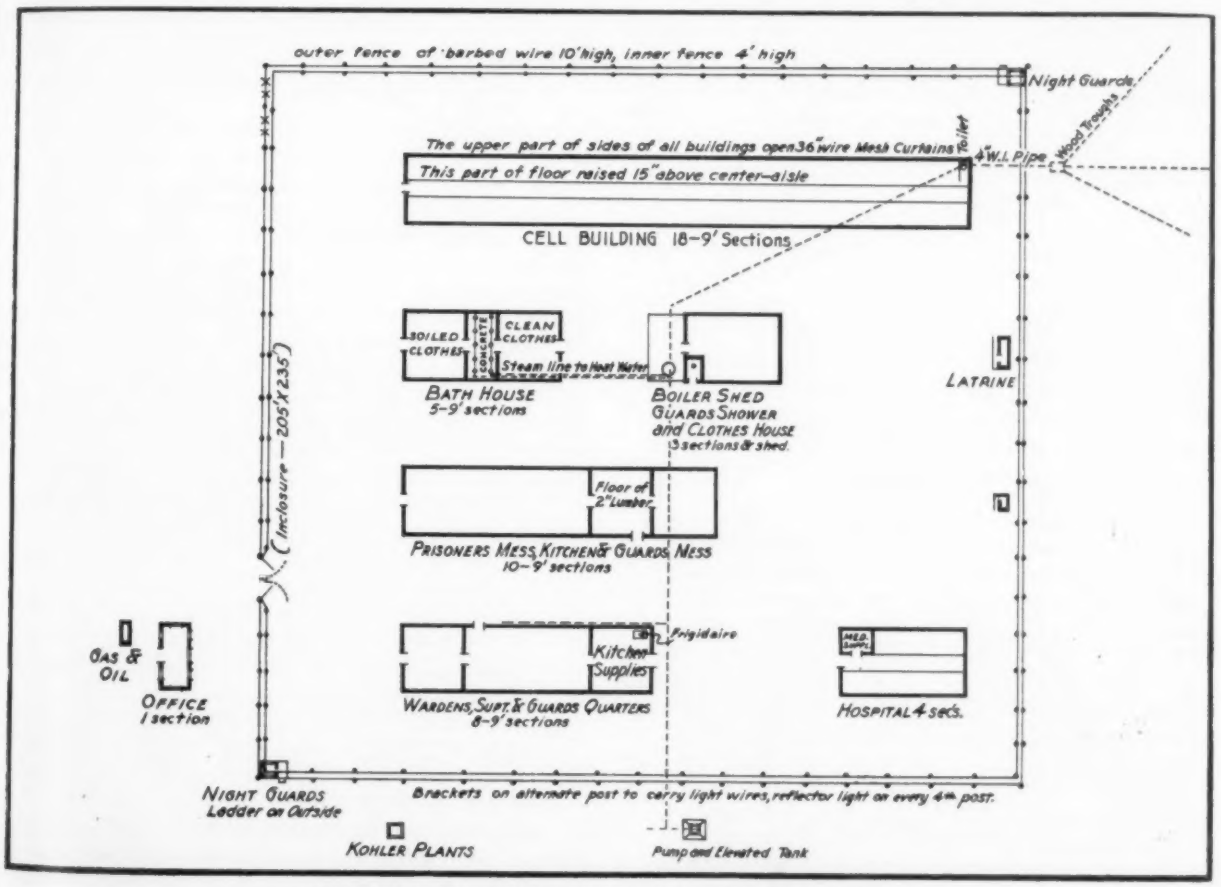
Assoc. Mem. Am. Soc. C. E.
Formerly Office Engineer, State Board of Administration

PROVIDING for the increasing number of prisoners, with the rapidly rising cost of government to the people, is a problem that all state officials have before them. Previous to the passage of acts forbidding the leasing of state convicts by the Alabama Legislature of 1927, this state had 1,100 convicts working in the mines under a lease to the mine operators. To give employment to the convicts as they were removed from the mines, the State Board of Administration, in whose charge are all state prisoners and prisons, made an arrangement with the State Highway Department for the employment of the convicts in the construction of state highways.

The plan finally adopted, upon which this work would be done, was that the Board of Administration acquire all construction equipment and construct the highways under a contract with the Highway Department. Instead of bidding against contractors on state projects, it was agreed that the unit prices in the contract be taken as an average of the lowest prices previously received by the Highway Department in competitive bidding by contractors. The Highway Department follows the same routine in handling the projects under construction by convict labor that is followed on other projects constructed by contractors.

The Camps

The convicts are worked in eighteen units or "camps," each having from 80 to 100 convicts, being conveniently located on the highway project. In selecting a camp site, care is taken that it is well drained and removed from residences, and if possible near a suitable water supply. The camps consist of a barb-wire enclosure, about an acre in area, in which are set up portable buildings used as a cell, a bathhouse, a clothes house, a kitchen and mess, quarters for guards, and a hospital. The general arrangement of a typical camp is shown in the diagram. The buildings are 20 feet wide and constructed of wood in sections 9 feet long, bolted together so as to be easily dismantled, transported and re-erected. To provide ventilation, an opening 30 inches wide is left on the sides of all buildings, and is covered by guard-rail mesh wire and a


outer fence of barbed wire 10' high, inner fence 4' high
Night Guards
The upper part of sides of all buildings open 36" wire Mesh Curtains
Toilet
4" W.I. Pipe
Wood Troughs
This part of floor raised 15" above center-aisle
CELL BUILDING 18-9' Sections
BOILED CLOTHES
CONCRETE
CLEAN CLOTHES
Steam line to Heat Water
BATH HOUSE 5-9' sections
BOILER SHED GUARDS SHOWER and CLOTHES HOUSE 3 sections & shed
LATRINE
Floor of 2" Lumber
PRISONERS MESS, KITCHEN & GUARDS MESS 10-9' sections
Enclosure — 205' X 235'
GAS & OIL
OFFICE 1 section
Kitchen Supplies
Frigidaire
WARDENS, SUPT. & GUARDS QUARTERS 8-9' sections
HOSPITAL 4 secs.
NIGHT GUARDS Ladder on Outside
Brackets on alternate post to carry light wires, reflector light on every 4th post.
KOHLER PLANTS
Pump and Elevated Tank

A TYPICAL LAYOUT FOR A HIGHWAY CAMP OF 100 PRISONERS
The Alabama State Board of Administration has established this standard plan, using portable buildings 20 feet wide in units 9 feet long

A ROAD-BUILDING CREW WHICH STARTED A 13.9-MILE CONCRETE ROAD PROJECT IN MOBILE COUNTY, ALA., IN DECEMBER AND COMPLETED IT IN APRIL

canvas drop curtain. That part of the cell and hospital buildings occupied by the cots is elevated 15 inches above the level of the aisle. This construction permits easy inspection under the cots and also provides a seat between the cots for the convicts.

Bathing Facilities

An arrangement whereby the convicts will be required to take a bath and put on clean clothes before entering either the mess hall or the cell building has recently been adopted. This is done by constructing a building in each end of which is a room where the convicts may hang up a complete change of clothes. Between these rooms is a shower-bath with ten shower-heads. To heat the water, a steam pipe is run from the boiler to the water pipe, connecting to the same pipe to which the shower-heads are attached and extending about 6 inches into this pipe to obtain a better mixture of the steam and water. The buildings are lighted by electricity generated by three Kohler units, which also furnish the power to operate the electric refrigerator and the water-supply pump. In order that camp buildings may be erected ahead of moving a camp, an additional set of buildings is provided.

The Commissary

Breakfast consists of fried white meat, grits or rice and gravy, sirup, biscuits and coffee. The noonday meal, prepared and sent out while hot in three-compartment dinner pails, varies each day in the week and consists of a vegetable cooked with a meat, cornbread and some fruit. The suppers consist of vegetables left from noon, cheese, raw canned tomatoes, sirup, fried meat, bread and coffee. On the fourth of July and Christmas the convicts are served with a rather elaborate meal. The convicts, well fed and with regular living habits, are in a good physical condition for work, in fact, much better than free labor.

Guards and Squads

Ordinarily, the convicts are worked in squads under one man, a guard-foreman; and under no circumstances are convicts ever shackled, chained or otherwise encumbered. With good management, escapes are remarkably few; in some cases there are no escapes from a camp during a year. Convict labor is used in all types of highway construction and, with the exception of power shovels, all equipment is operated by convicts. Excepting about thirty white "trusties," all the convicts employed on highway construction are negoes. The negro convict prefers to work on the outside in contact with the public; being a prisoner does not affect his pride and he is not "looked down upon" by other negroes.

Cost Accounting

As an aid in controlling the operations of the camps scattered over the state, a system of keeping the unit cost of each item of construction is in force. The elements of the costs are depreciation, repairs, supplies consumed, materials used, maintenance and supervision of convicts, and overhead or administrative expense. Based upon a daily report from each camp, these expenses are distributed against the various construction items. The cost statements prepared each month are: a comparative statement showing work accomplished, unit costs, cumulative unit costs, contract prices, and profit or loss for the period, copies of which are sent to each camp; and a detailed statement of operations of all the camps, prepared for the management. The daily average cost of maintenance of convicts furnished by the statement for the month of July, 1931, is as follows:

Food	$0.3175
Clothing	.0805
Housing expense	.0722
General expense	.0365
Medical expense	.0330
Tobacco money	.0165
Housing supplies	.0153
Discharge money	.0148
Travel expense	.0098
Office expense	.0044
Miscellaneous supplies	.0026
Escapes and rewards	.0011
Total maintenance expense	$0.6042

In the short time that convict labor has been employed on highway construction in this state it has been demonstrated that with good management work can be accomplished at a good profit, and when the state sets a convict free he is in good physical condition and trained for work.

Refuse Collection in San Francisco

With Private Collectors, the City Establishes the Fees Paid

THE city and county of San Francisco, population 634,394, does not consider the collection and disposal of refuse as a municipal function per se. The city endeavors only to control the mode of collection and disposal. The householder, storekeeper and restaurateur, hotel keeper, etc., pay for the service. The collections are handled by private individuals; about 500 refuse collectors in the city are licensed by and under the direct control of the Board of Health. All refuse is destroyed by incineration. The dumping of ashes, old plaster, and waste building material is allowed in certain sections where tidelands prevail.

The ordinance governing the collection and disposal of refuse defines "refuse" as all waste and discarded material from dwelling places, households and apartment houses, including waste or discarded food, animal and vegetable matter from kitchens of dwelling places, households and apartment houses, waste paper, cans, glass, ashes and boxes, and the cuttings from trees, lawns and gardens.

It is required that refuse consisting of waste or discarded food, animal and vegetable matter, discarded containers of food, animal and vegetable matter, and ashes, be collected and placed in suitable metal cans of sufficient capacity, by the householder or landlord of the dwelling place, and delivered to a refuse collector to be disposed of. Waste paper and boxes and other refuse materials not subject to putrefaction or decay, and cuttings from trees, lawns and gardens, may be placed in any suitable container and delivered by the householder or landlord to a refuse collector for disposal, but it is optional with the householder or landlord whether he disposes of the paper himself or delivers it to the collector. Waste paper delivered to a collector must be handled without extra charge. Refuse which the ordinance requires to be deposited in a metal can must be removed daily from the dwelling where it originates and must be either delivered to a refuse collector or deposited in a non-combustible container in some room or place not used for human habitation.

Disposal by Incineration

The incinerator plant now in operation in San Francisco is under private management, having reverted to the city and county through a lapse of franchise several years ago, but the Board of Supervisors has placed it under the control of the Scavenger's Protective Association, which is responsible for the upkeep and maintenance of the plant and the destruction of all waste matter. The Association pays nothing to the city in consideration of such upkeep. The approximate amount of garbage destroyed in the city daily by incineration is about 600 tons. The refuse collector pays a fee of $1.00 per ton for the destruction of the material. There are 50 motor vehicles, 50 horse-drawn vehicles, 14 paper wagons, and 48 swill wagons, 162 vehicles in all, engaged in collecting and hauling at the present time.

Some years ago, San Francisco invested $300,000 in the construction of incinerator plants to be under municipal control, but it appeared, after tests, that the apparatus installed was not feasible from the standpoint of profit to the city.

Hog Feeding

Swill and kitchen refuse is fed to hogs. This feature is handled by a group of individuals who are not at all identified with the removal of what is known as "general refuse"; they merely remove from restaurants, hotels and like places of business such wet refuse as will make proper feed for swine, the collector paying a price for this privilege, the terms of which are agreed upon by the parties interested.

Fees for Collection

According to the municipal ordinance which initiated the collection of refuse by private collectors, in Section 6, monthly rates for the collection of refuse which the collectors were permitted to charge were adopted. These allow charges from 40 to 85 cents for one collection per week from one to 12 rooms, where the collection is made from the ground floor. The rates increase to $1.15 to $1.70 for four collections per week. The rate for collection from the second floor where the collector is required to go over one stairway from the ground floor or basement range from 45 cents to 95 cents for one collection per week from one to twelve rooms, and $1.20 to $1.80 for four collections per week. The rates for collections from the third floor, this being two stairways above the ground floor or basement, are from 50 cents to $1.00 for one collection per week from one to twelve rooms, and $1.25 to $2.10 for four collections per week. Collections from the fourth floor are 55 cents to $1.10 for one collection per week from one to twelve rooms, and $1.45 to $2.45 for four collections per week. Similar monthly rates for the collection of refuse from apartment houses have been arranged for units of 10 to 600 rooms. In determining the number of rooms in any household, building or apartment, in order to ascertain the rate for collection of refuse, halls, alcoves, storerooms, closets, bathrooms and toilets are not considered as rooms, nor are basements or attics considered as rooms unless they are occupied as living quarters.

GROUP INSURANCE FOR MUNICIPAL EMPLOYEES

ENDORSEMENT of group life insurance has recently been given by the city authorities of Dover, N. J., who have adopted such a policy with the Prudential Insurance Company of America; 121 municipal employees are covered for a total of $135,000.

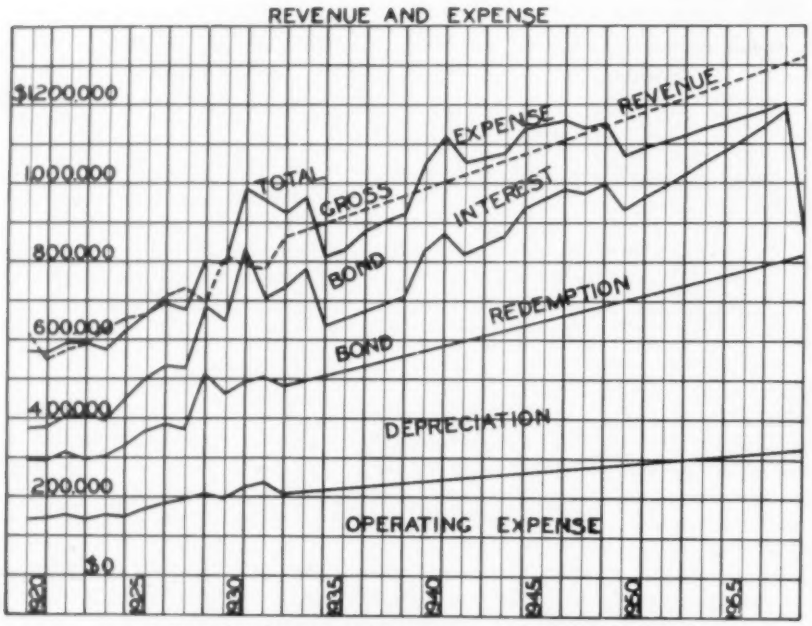
Each worker is insured for $1,000 to $3,000 according to his position. The policy is of the contributory type, which means that the employees themselves pay a part of the premium and the city the remainder.

Under this policy the Fire, Police, Library and Water Departments of Dover are included.

Planning the Future Financial Structure of a Water Works

Problems in Water Rates

By **W. A. KUNIGK**
Superintendent of Water Division, Department of Public Utilities, Tacoma, Wash.



AN ANALYSIS OF ALL PROPOSED PLANT EXPENDITURES AND ESTIMATED INCOME DURING THE ENTIRE REDEMPTION PERIOD OF ALL PROPOSED WATER-WORKS BOND ISSUES FOR TACOMA

CAREFUL planning in water-works development from ten to twenty years in the future is necessary if the community served is to enjoy the benefits of orderly progress in water-system plant growth and a stable water rate that will provide sufficient revenues to carry out projected plans.

As a broad policy, water rates should be reasonably stable over a period of years. This factor becomes especially important when water rates are being considered by representatives of prospective industries that are desirous to sign up contracts for ten years or longer. Men financing large industrial plants usually want to be shown not only that the city will be able to maintain the rate schedule quoted, but that there is a possibility of a decrease, rather than an increase, in sight at some future time.

Naturally, necessary expenditures for additional supply planned, as well as for extensions and betterments in the distribution system to take care of such large industries, have a direct bearing on the rate question. Unless a close study is made of the financial ability of the water department to carry out such a plan of expansion on the rate basis contemplated, serious public opposition might develop and loss of confidence in the public officials charged with laying down the policy of such a utility.

Tacoma Water Department Completely Self-Supporting

In Tacoma the Water Department is operated as a separate branch of the Municipal Utility Department and does not receive aid of any kind from the general fund or other city departments, except for services rendered. In fact, such service as hydrant service, sewer flushing and street sprinkling is furnished to the city at a charge of $78,000 per annum, while the Department estimates that the actual cost of such service is in the neighborhood of $135,000. The Water Department also pays a rental for office space occupied in the City Hall, as well as for the prorated cost of the services of the City Corporation Counsel, City Treasurer, City Controller and City Clerk. Besides these expenditures, the Water Department has for many years paid a 5 per cent gross revenue tax into the general fund. In the current year this gross revenue tax will be 7½ per cent, or approximately $60,000. After providing for these items of expense, it is important that there remain a sufficient balance from the gross revenues to cover all other obligations. Aside from the expense items already enumerated, it is the aim of the Tacoma Water Department to have the gross revenue produce a sufficient income to cover operation and maintenance expense, interest and redemption of outstanding bond obligations and depreciation of plant. The only funds available from the Department for plant replacements, betterments and extensions are, therefore, the moneys from the depreciation fund, surplus and moneys from utility bonds authorized by the City Council. In other words, the Water Department must stand on its own feet.

On account of the industrial growth the city of Tacoma has experienced in the last few years, with the consequent demand for large quantities of additional water, a number of problems have come up for study and consideration in connection with the water rates that no doubt are more or less typical of the problems other cities have had to meet. A brief review of some of these problems will provide a better perspective of the Water Department's finances and their relationship in reference to the water-rate problem.

Constant Maintenance and Replacement

The principal source of Tacoma's water supply is derived from the Green River through a single gravity pipe line, 43 miles long, with a capacity of 42,000,000 gallons per day when constructed. This line was completed and placed in service during 1913. Forty-one miles of the total

length were built of continuous wood stave pipe, and in 1924 it became necessary to start the reconstruction of the wooden portion of the pipe line. A program was worked out whereby every year from 1½ to 3 miles of pipe is to be rebuilt, according to the requirements of the physical condition of the pipe, so that the whole pipe line will have been renewed by 1940. In view of the fact that the rate of depreciation is computed on a plant value of wood pipe on pre-war prices, all the funds derived from the depreciation allowance are used up in gravity pipe line reconstruction, and new capital must be added to replace with the more expensive steel and concrete now used. A large part of the program for plant extensions and betterments is therefore financed by the issuance of utility bonds.

Cost of Developing Additional Water Supply

On acccount of the advent of several large pulp and chemical plants in the city, it also became necessary to start the development of an additional water supply. In bringing these new plants to the city, the Water Department had agreed to furnish water to the industries on a basis of 2 cents per 100 cubic feet, or $26.67 per million gallons, for consumptions from 1,000,000 to 3,000,000 gallons per day; for all consumptions over 3,000,000 gallons per day, water was to be supplied on a basis of 1½ cents per 100 cubic feet, or $20 per million gallons. Upon negotiations with a number of pulp-plant engineers, it became evident that after consideration of other local conditions, such a low-water rate as quoted would act as an additional inducement to locate these plants in Tacoma.

Before the question of the development of this industrial water supply came up for a decision, careful estimates were made of all expenditures and possible gross revenues for a period of over twenty years in the future, so that an analysis could be made as to the financial ability of the Water Department to carry out this program under the existing water rates for ordinary domestic and industrial consumers and the special rate under consideration for the new large industries. Several gravity systems were investigated and estimates were prepared, but it soon became apparent that it would be impossible to carry out the other financial obligations of the Water Department and at the same time embark on the construction of an additional gravity supply system, involving an expenditure of some $2,500,000 or $3,000,000, without a considerable raise in the present water rates. This, of course, was not contemplated.

A study of the water-supply records indicated that with the additional load of from 12,000,000 to 13,000,000 gallons daily on account of the new industries, the deficiency in the supply line would, during the summer months of June, July and August, be as much as 15,000,000 or 16,000,000 gallons daily. There appeared to be ample capacity in the Green River gravity system to take care of the city's demands during the rest of the year for some years to come. From 11,000,000 to 12,000,000 gallons daily of the midsummer deficiency could be made up from an auxiliary well supply system which the Water Department has maintained in the South Tacoma district since 1908. A study of the general favorable geological conditions in and near South Tacoma for the development of a large water supply from wells at a low plant investment, in conjunction with the low power rate from municipally owned power plants, led to the decision to develop an additional water supply from wells, equal in capacity to that of the gravity supply system. When this plant is completed, the city will have ample protection in case of a complete failure of the gravity supply line during any time of the hazardous reconstruction period. A well system supply of 25,000,000 gallons daily capacity has already been developed, and the plan now being carried through promises to meet all expectations under the original estimates without upsetting the present rate schedule. The full effect of the benefits of this development on Tacoma's water rate will of course be more apparent in the future than at the present time. Some of the major expenditures for betterments that are part of Tacoma's program are enumerated, to indicate the necessity for a study of plant requirements and finances for the future:

1. Reconstruction of the Green River gravity system between the period from 1923 to 1941. Estimated cost, $3,760,000. Capacity of system to be increased from 42,000,000 gallons daily to 57,000,000 gallons daily.

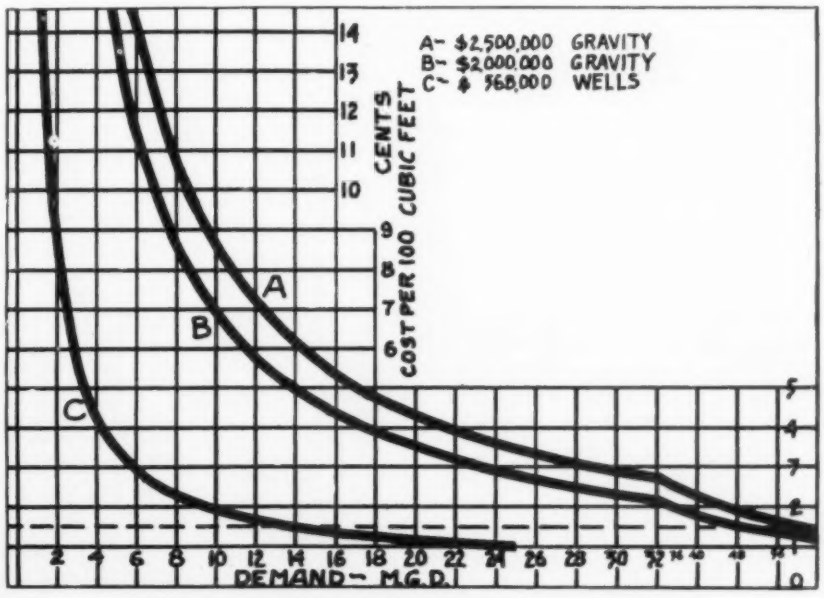
2. Duplicate gravity pipe line of 12 miles in length to be built between 1936 and 1939 from a point near McMillin reservoir to Tacoma. Estimated cost, $995,000.

3. The present air-lift well system of 12,000,000 gallons daily capacity to be replaced by a new well development of not less than 40,000,000 to 45,000,000 gallons daily capacity. Work began in 1930 and is to be completed during 1932. Estimated cost of well development and pumping equipment for individual wells, $200,000.

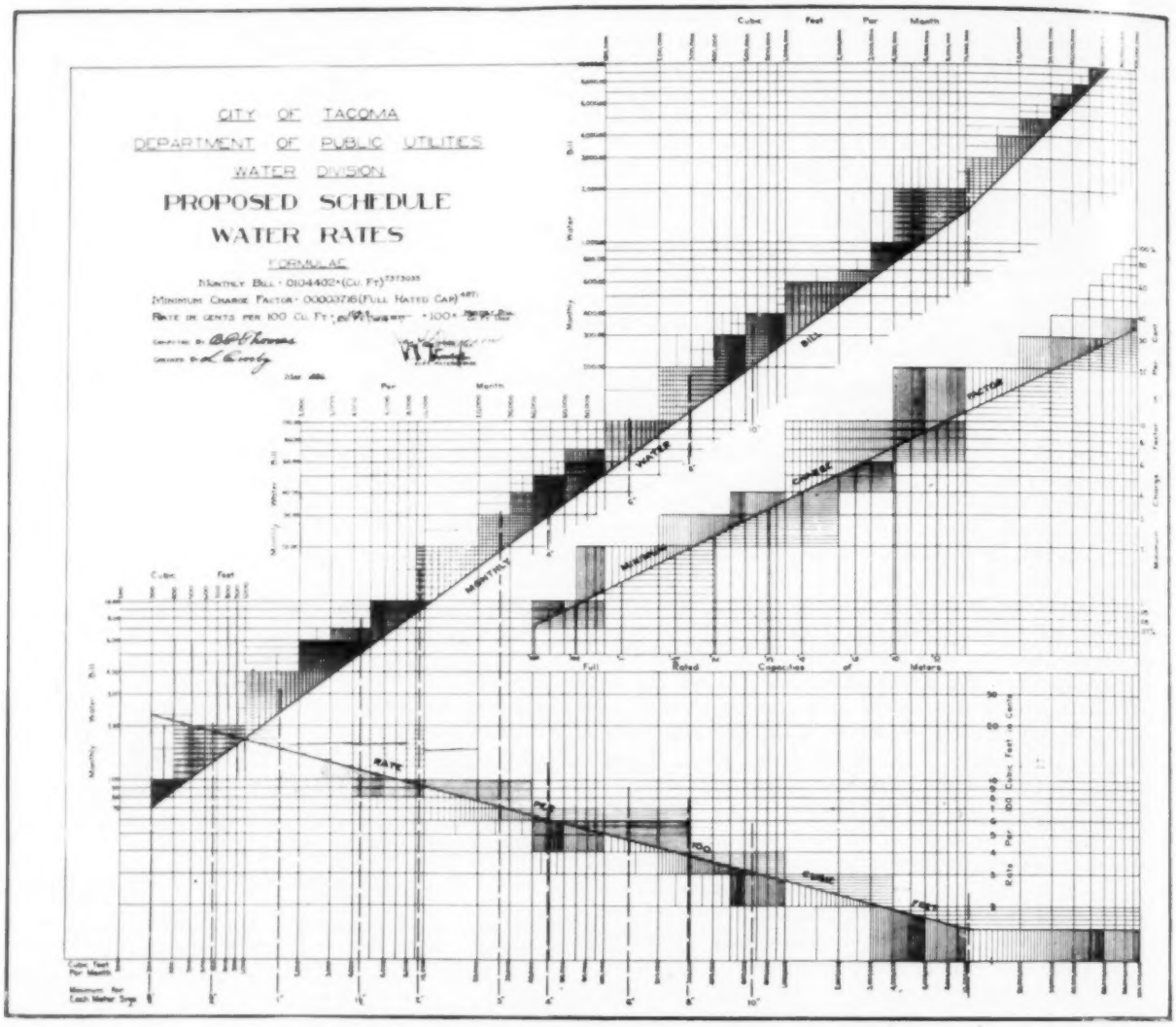
4. Trunk main program, especially for industrial area, was begun in 1928 and is to be completed during 1932. Estimated cost, $602,000.

5. Booster pumping plant, capacity of from 25,000,000 to 30,000,000 gallons daily, with inter-connections between low- and high-service systems, will be completed during 1931 and 1932. Estimated cost, $120,650.

6. Major trunk mains in distribution system to be completed between 1929 and 1933. Estimated cost, $400,000.



AN ANALYSIS OF POSSIBLE ECONOMIES FROM A WELL DEVELOPMENT AS COMPARED WITH THE HEAVY CARRYING CHARGES OF A GRAVITY PIPE LINE DEVELOPMENT FOR TACOMA



A GRAPHIC PRESENTATION OF A PROPOSED WATER RATE FOR TACOMA

A complete picture illustrating the financial survey of this program and other necessary expenditures and plant income is given in diagram form under Revenue and Expense, on page 68. This diagram shows a clear analysis of all proposed plant expenditures and estimated income during the entire redemption period of all proposed bond issues. Such a study of expenditures and income commends itself, especially in connection with proposed rate studies.

The second diagram is an analysis of possible economies from a well development as compared with the heavy carrying charges of a gravity pipe line development. It also illustrates the fact that future well development can be made in successive steps of small units, keeping in line with future growth without burdening the Water Department with large amounts of capital invested for many years in idle plant capacity. The most surprising result brought out by the well development is that a complete auxiliary well system can be installed, under conditions existing in Tacoma, at a cost less than one-sixth of that of the present gravity system. The effect of this well organized program of construction on future water rates is self-evident.

A Water Rate Study

The third diagram graphically presents a study that the Tacoma Water Department has made of a proposed water rate for the city of Tacoma to supersede the present rate, which in some respects is not entirely satisfactory. The present meter rate is made up of a ready-to-serve charge and a charge for water furnished as follows:

For ⅝-inch meters	$0.50 per month
For ¾-inch meters	0.75 per month
For 1-inch meters	1.50 per month
For 1½-inch meters	3.00 per month
For 2-inch meters	5.00 per month
For 3-inch meters	10.00 per month
For 4-inch meters	15.00 per month
For 6-inch meters	30.00 per month
For 8-inch meters	50.00 per month
For 10-inch meters	90.00 per month
For 12-inch meters	130.00 per month

The charge for water consumed is 10 cents per 100 cubic feet for the first 5,000 cubic feet; 6 cents per 100 cubic feet for the next 25,000 cubic feet; and 4 cents per 100 cubic feet for all consumptions over 30,000 cubic feet.

The ready-to-serve charge covers a portion of the cost of furnishing water based on the capacity of the meter and the cost of providing reserve capacity at all times,

regardless of the amount of the consumption. The service charge produces approximately one-third of the meter revenue in Tacoma and helps, therefore, to reduce the unit rate on all water consumed. In reference to the application of the service charge, we find that the consumers invariably look on this charge as an additional charge over and above the cost of water furnished. It is for this reason that the Tacoma Water Department proposes to adopt a minimum charge in lieu thereof, for which a certain quantity of water will be furnished. The rate schedule worked out in the diagram is what might be termed the logarithmic rate scale. The equations involved in establishing the slide as contemplated under the scale are given on the diagram.

The novel feature about this rate scale is the minimum charge based on a load or charge factor which is used in connection with power rates, but which the writer has never seen applied to water rates. For instance, it was assumed that a large consumer requiring approximately 6,000,000 to 8,000,000 gallons of water per day should guarantee to the Department an income of not less than $1,500 per month, or $18,000 per annum, in order to protect the necessary plant investment as far as possible. For this minimum charge the consumer would be entitled to 75,000,000 gallons per month, which is at the rate of $20 per million gallons, or 1½ cents per 100 cubic feet. This is the lowest rate now quoted by the city of Tacoma. On the other end of the scale, it was assumed that a minimum revenue of 70 cents per month was necessary from a ¾-inch service with ⅝-inch meter, and that 300 cubic feet of water would be furnished for this minimum charge. The slide between these two extremes in the rate represents a straight line on the logarithmic scale of the diagram.

The minimum charge factors for different sizes of meters represent the coefficients to be applied to the maximum capacities of the respective sizes of meters, assuming approximately a 5-pound pressure drop in the meter. The minimum monthly charge for each size of meter is then established on the basis of the regular scale rate applied to this minimum quantity of water so determined. The assumption for the minimum charge requirements for the smaller meters is based somewhat on Allen Hazen's Table of Load Factors in his book on "Meter Rates," and for the large meters these charges were based on an arbitrary minimum revenue which it was felt was necessary to protect the investment of the Water Department.

From a theoretical standpoint, this scale is simple enough, but its practical application is not quite so simple as it looks. The diagram would have to be plotted on a large-scale logarithmic paper, or bills would have to be computed with a log-log slide rule. Either method would be difficult to explain to the consumer.

The Water Department has already computed a table from which all bills for consumptions from 0 to 10,000,000 cubic feet can be read directly. This, the writer feels, is the simplest method for making this rate scale practical in its application.

The writer herewith wishes to acknowledge his indebtedness to Lothrop Crosby, Hydraulic Engineer in the Water Department, and B. P. Thomas, Assistant Superintendent in the same Department, for their assistance in the preparation of estimates and the rate diagram, which are part of this discussion.

ACKNOWLEDGMENT.—From a paper presented before the Pacific Northwest Section of the American Water Works Association.

A Loan Fund Instead of a Dole

COOPERATION of local merchants and banks in making loan funds available for unemployed citizens of good character as a means of stimulating prosperity and maintaining self-respect, is suggested by the Editor of THE AMERICAN CITY in an article published in the *Kiwanis Magazine* for November. The proposal is that such loans be made on the personal note of the borrower, with the endorsement of a local merchant, the funds to be spent for food, clothing or other goods to be purchased locally, and the sums borrowed to be repaid out of future earnings.

The article suggests that to protect merchants and banks against any possible shrinkage in ultimate collections on these notes, a group of public-spirited citizens might lend cash or credit to create an unemployment loan endorsement fund, by which any bank, for a small percentage of the amount of all such notes discounted by it, would be guaranteed 90 per cent collectibility on each note. Loss on any note up to 90 per cent would be paid to the local bank out of this guarantee fund, the remaining 10 per cent to be borne one half by the bank and one half by the merchant endorsing the note. The possible development of the idea on a state-wide or nation-wide basis is also suggested.

To Coordinate Municipal Purchasing

ON December 1, 1931, the New York State Conference of Mayors and Other Municipal Officials is inaugurating a municipal purchasing service for New York State cities and villages. Every month there will be sent to the purchasing agent of each city, a blank form on which are listed about one hundred different materials which are customarily purchased by municipalities during the year. Each purchasing agent will report on this blank form the quality and quantity of all articles purchased by his municipality and the unit prices paid. The forms are to be returned to the Mayors' Conference not later than the 10th of each month, and from them a confidential report will be prepared and mailed to each purchasing agent.

It is hoped that these reports will coordinate the purchasing of materials in New York State municipalities. With such information, each purchasing agent can check the prices his municipality pays with prices in other localities and may thus be able to obtain better prices or better quality. Because of the difficulty of reporting the quality of the goods purchased or the detailed specifications under which the purchases are made, the prices will not always be comparable. There are also other factors which cannot be indicated, but the information on quantity and prices paid will be of considerable value.

E. D. GREENMAN.

Sewerage and Sewage Disposal at Freeport, N. Y.

By L. L. LUTHER

Manager, Department of Sanitation,

Freeport, Long Island, N. Y.

THE ATTRACTIVE SEWAGE PUMPING STATION AT FREEPORT

THE incorporated village of Freeport is situated in Nassau County on the south shore of Long Island, in a location very favorable for a rapid and healthy growth. The municipality is composed of 19,475 persons, 5,281 residences and buildings, 289 stores and 47 public buildings.

The necessity of establishing a sanitary sewer system was apparent in 1912, but no definite steps to that end were taken until 1926. Today, Freeport has a total of 38.5 miles of sanitary sewers varying in size from 8 to 27 inches, and a modern disposal system consisting of pumping station, treatment works, outfall sewer and force main.

Trunk Lines

The present design provides for a contributory population of 42,000 people, with a maximum flow of 250 gallons per capita per day. The trunk sewers are designed to carry this flow when running 0.7 full and the laterals when running 0.5 full. This per capita allowance for the maximum flow is high, but is is considered a reasonable one when the ground-water conditions are taken into consideration. The present water consumption in the village is about 68 gallons per capita, or about one-quarter of the estimated maximum per capita rate of sewage flow. The present population is 19,475, therefore the trunk lines are designed for a connected population of about twice the present population of Freeport, with a maximum sewage flow of about four times the present average per capita water consumption. The trunk sewer will be sufficiently large for at least twenty years.

Lateral Lines

There are at present approximately 28 miles of 8-inch and 10-inch laterals laid in the village. Practically all the business and apartment house areas are sewered and a large part of the residential sections. These sewers were installed some time after the trunk sewers and treatment plant were built.

Pumping Station

The pumping station consists of electric motor-driven pumps automatically operated, installed in three separate units, each unit of 1½ million gallons capacity. A concrete storage well of 30,000 gallons capacity is installed beneath the pumping station to balance the flow of sewage without backing up the sewage into the main sewers above the normal flow line.

The piping, valves, etc., are installed to take care of a flow of 10 million gallons per day, corresponding to a maximum flow of 250 gallons per capita for a population of approximately 40,000 persons. The pumps that are in use at the present time will take care of the flow from a connected population of from 10,000 to 12,000. These pumps will be replaced with large ones when the time comes, without interrupting the use of the pumping station.

The pumps are placed underground, are easily accessible and driven by 15-horsepower motors. They are automatically controlled by the level of the sewage in the suction well. When the sewage rises to a predetermined point, one of the pumps cuts in. If the flow is greater than one pump can handle, the sewage will continue to rise in the suction well until a second predetermined height is reached, when the second pump will start automatically, and so on with the third. The order of the pumps is changed daily, so that no one pump is used continuously. The pumping station is largely underground. The superstructure is built of brick. The grounds are planted with shrubbery, and passers-by often wonder what this very attractive place is; in fact, on more than one occasion we have had inquiries from strangers as to whether the village wanted to rent that little brick building for a gasoline station.

The operation of the station is practically automatic. One operator visits it three times a day to clean off the bar screens, oil the motors, etc. All screenings are trucked to the municipal incinerator and burned daily with the refuse. There are no odors, noises or other unpleasant features; in fact, we feel that the plant enhances the value of the surrounding properties.

Treatment Plant

The sewage is pumped to the treatment plant through a 24-inch reinforced concrete main approximately one mile in length.

The treatment plant consists of reinforced concrete settling tanks, chlorinating chamber, concrete sludge digestion tanks and two glass-covered sludge drying beds. The immediate construction is built to take care of a con-

nected population of approximately 10,000 persons. Extensions can be made from time to time as required, without interruption to the plant. The capacity of the plant is based upon an estimated average flow of 125 gallons per capita and a maximum flow of 250 gallons per capita.

The settling tanks are placed underground, constructed in two units with a capacity sufficient to give a detention period of four hours with 5 per cent additional capacity for sludge storage. The tanks are covered with a concrete cover with sufficient iron doors to make skimming easy. Sludge is removed through 6-inch sludge pipes located at the invert of the hopper bottoms of the tanks, and is pumped into the digestion tanks without interrupting the operation of the settling tanks. The settled sewage passes into the chlorinating chamber, and after a detention period of approximately 30 minutes, it passes over a V-notch weir to the 30-inch outfall sewer, which terminates about 2,500 feet from the plant. The sewage enters a manhole connected to a 24-inch cast iron pipe equipped with four 24 x 12-inch diffusers; these empty into Freeport Creek. The settling tanks cover an area of approximately 50 x 60 feet.

The sludge digestion tanks are placed partly above ground and provide for a connected population of 10,000 people upon the basis of 4.5 cubic yards of sludge per million gallons and a detention period of 150 days. This amounts to 2.3 cubic feet per capita. The tanks are in two units covering an area of about 25 x 55 feet. The sludge is pumped from the settling tanks into the digestion tanks, the liquor decanted and returned to the settling tanks. The sludge remains in the digestion tanks until it has been converted by bacterial action into a harmless and odorless residue, which is removed about every three months, by gravity to the sludge drying beds. Tanks are covered with a concrete roof with necessary openings.

There are two glass-covered drying beds. These have a total area of approximately 5,000 square feet, providing one-half square foot per capita. They were constructed by the Lord & Burnham Co. and are of its standard design. The beds consist of 4 to 6 inches of sand laid on 10 inches of broken stone. Tile drains with open joints are laid beneath the stone, and the liquor is returned to the drainage well under the head house and is thence pumped through the decanting line back to the settling tanks. When sludge is dry and ready for removal, after a period of from six to ten days in good drying weather, it is removed by hand from the beds. Ample provision is made for its removal.

A brick building 25 x 30 feet, known as the head house, contains the two gasoline-driven sludge pumps, the chlorinating apparatus, the Yarnell V-notch Waring flow meter, and the heating plant. The building is of an ornamental design and the grounds are attractively planted.

All piping, the outfall, sludge pumps, pumping station and head house have been designed to meet the ultimate requirements.

The treatment works and trunk lines were designed by Nicholas S. Hill, Jr., consulting engineer, of New York City.

COSTS

Treatment plant	$116,330.00	
Outfall sewer and diffuser	24,487.00	
Force main	26,950.00	
Pumping station	34,355.00	
Total cost plant		$202,122.00
Trunk lines 10.5 miles)	$325,000.00	
First district (17.5 miles)	333,809.00	
Second district (10.75 miles)	175,000.00	
Total cost sewers, etc., to date		833,809.00
Grand total		$1,035,931.00

Operation of the Plant

Two men are employed in the care and operation of the sewage treatment works. A small, complete laboratory has been installed for the making of analytical determinations necessary for the efficient operation of the treatment work.

Daily orthotolidin tests are made, Imhoff cone tests, pH determinations on the effluent, influent and sludge, and stability tests by methylene blue, and the efficiency of the drying beds is watched very carefully by sampling the sludge daily and noting the daily loss of moisture. The moisture, organic and mineral content are determined with each run-off of sludge. We have experimented as to how much the top ventilators and side windows of the

A GENERAL VIEW OF THE SEWAGE TREATMENT PLANT

glass enclosures should be left open or closed, and experience has proved to us that in the summer months the top ventilators should be open at least six inches and the side windows from two to three inches, to stop sweating. In the winter months only the top ventilators are left open, for about one inch, and no sweating has been noted during that period.

The temperatures of the settling tanks and digestion tanks and the outside temperatures are taken daily. Wind directions are noted daily.

A very complete daily log sheet is in use, and all the necessary data concerning the operation of the plant are kept. This is of great value not only for the present but for the future; when the time arrives for extensions all the necessary data will be available.

A Yarnall Waring V-notch weir recording meter is located in the head house and works off the float chamber that also governs the chlorine machine. This enables us to keep an accurate record of the sewage flow.

Sludge is pumped three times a week at the present time. This will be increased to daily pumping just as soon as the sewers under construction are completed.

Sedimentation tanks are skimmed four times a week and all floating material broken up by hosing. Material in suspension, after hosing, is skimmed off and removed to the digestion tanks.

All four digestion tanks are well seeded and show a pH of from 7.0 to 7.4. Tests are made on the sludge by the filter method. The tanks are so arranged that the sludge is worked from No. 1 tank through to No. 4 tank and run from No. 4 to the drying beds. At no time are the tanks emptied. As raw sludge is added, semi-digested sludge is run into the other tanks.

No trouble has been encountered except some gasification of the sedimentation tanks. This has been overcome by more frequent pumping of the sludge; also by the finding of a paint that would last on the inside of the tank covers and on pipes immersed in the tanks. After trying many formulas, Inertol was tried and up to this time it has proved very successful. The iron work in the drying beds is now being painted with aluminum paint.

STATISTICS—SEWAGE TREATMENT PLANT

SEWAGE FLOW

Type of sewage	Fresh, domestic
Industrial wastes	None
Average daily flow	500,000 gallons
Population served at present	2,200 persons
Pounds of chlorine applied per million gallons	43.3 pounds
Kw. per million gallons (pumping)	69.35 kw.
Total cost per million gallons	$12.60

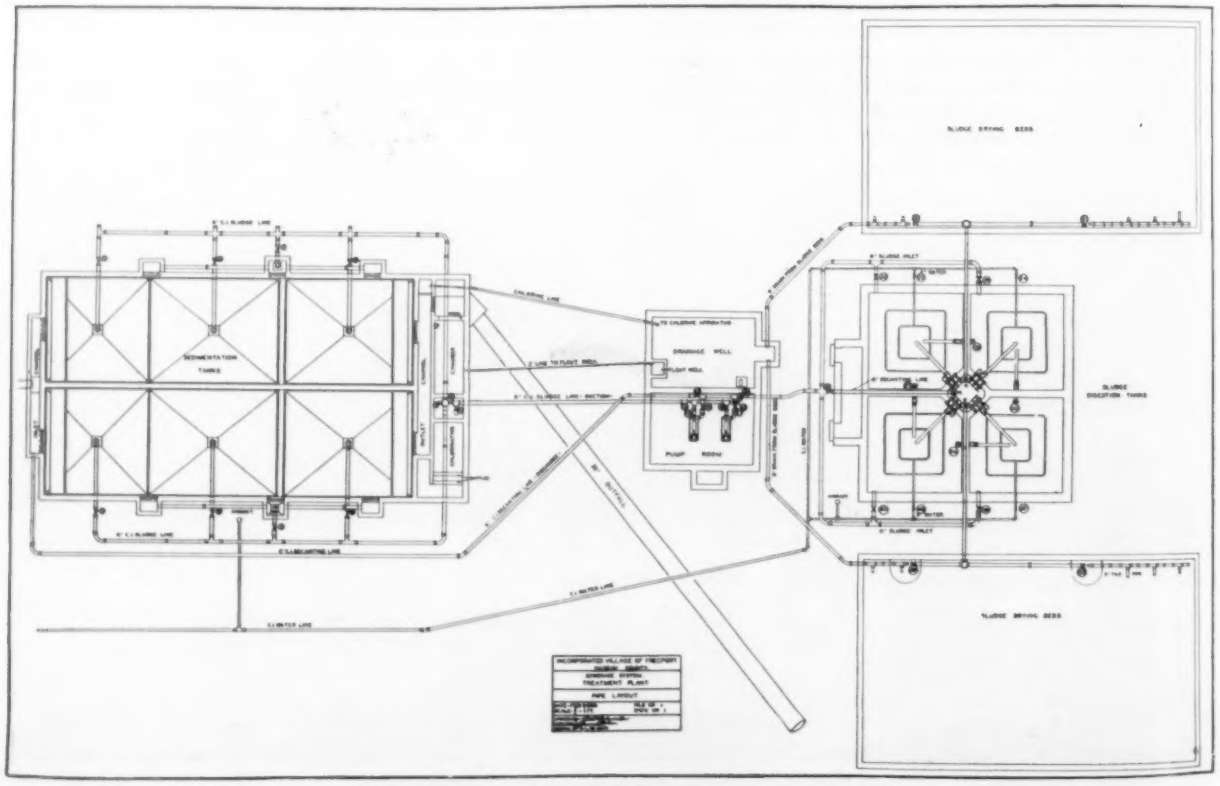
LABORATORY DETERMINATIONS

Average residual chlorine (orthotolidin test)	0.4
Average percentage solids removed (Imhoff cone 2-hr. setting)	97.3
Average pH of influent	6.4
Average pH of effluent	6.8
Average pH of digestion tanks	7.1
Average percentage of moisture in wet sludge	86.4
Average percentage of organic matter in wet sludge	13.6
Average temperature of influent	43 degrees
Average temperature of effluent	47 degrees
Average temperature of digestion tanks—summer	73 degrees
Average temperature of digestion tanks—winter	42 degrees
Relative stability of tank effluent	48 per cent

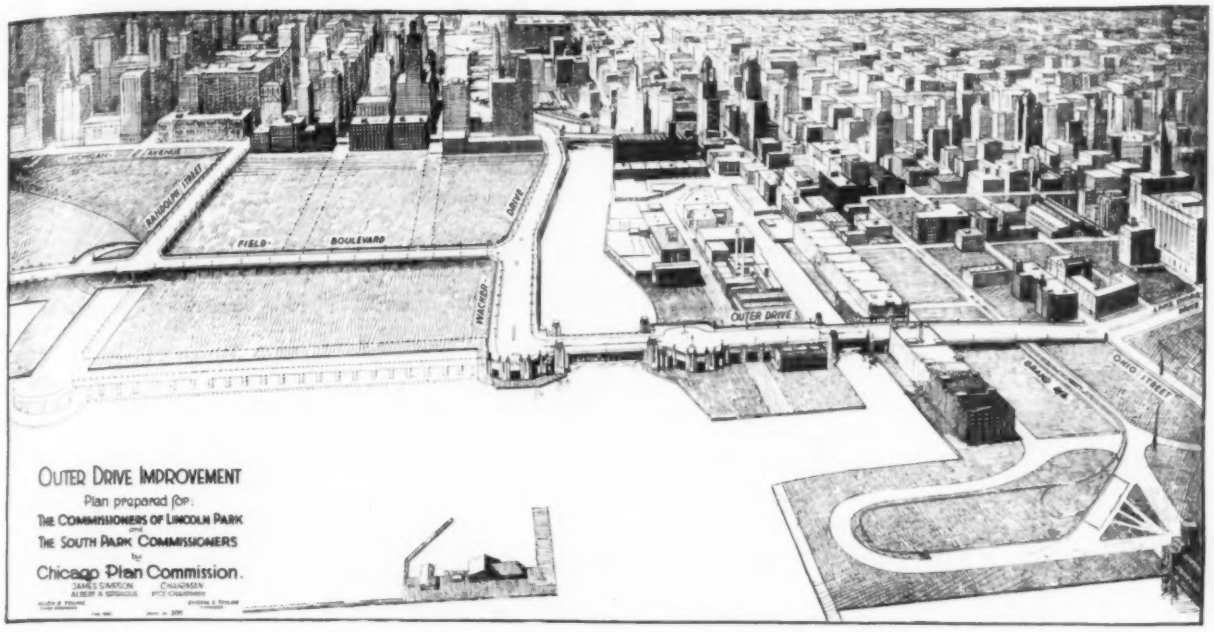
Conclusion

Fortunately, from the inception of the sewage treatment works, the officials have taken a keen interest in our work. They have cooperated in every way possible. On various occasions we have had delegations of the business men's and civic associations as our guests. This has been a great help to break down the average impression that John Taxpayer has concerning sewage works, and it has made people realize that after all there is something more to a treatment plant than an inlet and an outlet pipe.

ACKNOWLEDGMENT.—From a paper presented before the New York Sewage Works Association.



LAYOUT OF THE SEWAGE TREATMENT PLANT AT FREEPORT

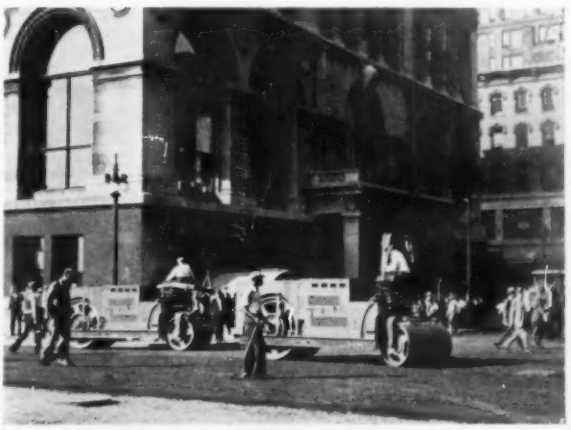


A Chicago Traffic Problem Solved by a Week-End Job

Chicago's Loop District Is Now Linked with the Outer Drive Along the Lake Shore

A NEW link bridge is being built at the mouth of the Chicago River so that traffic from the northern section of Chicago can avoid the congestion on Michigan Avenue and continue into the south-side section along the lake front. Likewise, traffic from the southern section to the city using the Outer Drive will be able to reach these districts by turning up the Randolph Street viaduct.

At the present time, the Illinois Central Railroad, an electrified system, has a temporary suburban terminal, which is soon to be replaced by a larger and more modern structure. The new terminal is located directly under the newly constructed Randolph Street viaduct, and will be built into the framework of the viaduct. After this viaduct is completed, it will serve immediately as an elevated continuation of Randolph Street leading to the Outer Drive, and eventually it will become an entranceway to the extensive air-tight properties now available over the tracks of the Illinois Central and Michigan Central Railroads.



EIGHT-TON TANDEM ROLLERS
Compacting the asphalt binder courses at the intersection of Michigan Avenue and Randolph Street

Week-End Construction

In building the three-way Michigan Avenue approach, it was necessary to exert every effort to complete the job as speedily as possible on account of the heavy flow of pedestrian and motor-car traffic. The work of building the three-way approach was awarded to the R. F. Conway Co., Chicago contractors, who had already completed several jobs where the element of speed was very important. The street at this point was closed on a Saturday at 8 P. M. and was opened the following Monday at 9 P. M. The approach across Michigan Avenue leading from Randolph Street proper was built at about a 3 per cent grade and measures approximately 150 feet long. The other two approaces on Michigan Avenue extend at right angles from the center of the Randolph Street viaduct entrance and slope down 175 feet north and south from this point,

at about a 2 per cent grade. In going over either of these sections, traffic experiences no difficulty in the rise, because it is so gradual, and the appearance of the avenue is in no way marred by the arrangement.

The actual construction of the new pavement consisted in removing the creosote blocks from Randolph Street and the top asphalt course on Michigan Avenue, both of which were previously laid on concrete base. A sand fill was placed and compacted with two 8-ton Austin 4-cylinder tandem rollers. After this, a concrete slab, varying in thickness from 4 to 9 inches, was poured, using an Alumnite cement with a 1:3:6 mix, giving a 28-day concrete in 24 hours. When the 24-hour curing period was over, a 1½-inch asphalt and stone binder cushion was placed, and on top of this a 2-inch asphaltic concrete top wearing surface was laid and sprinkled with granite chips. Both courses were rolled before the thoroughfare was opened to traffic.

The development of the lake front, and more recently, the Outer Drive, and the proposed connecting viaduct, are, according to prominent observers, destined to have a far-reaching effect for good upon the business and shopping centers north and east of the Loop. Growth in these sections has been phenomenal during the past few years, as to magnitude and architectural beauty, and it is believed that these new municipal projects will be a strong force furthering that growth.

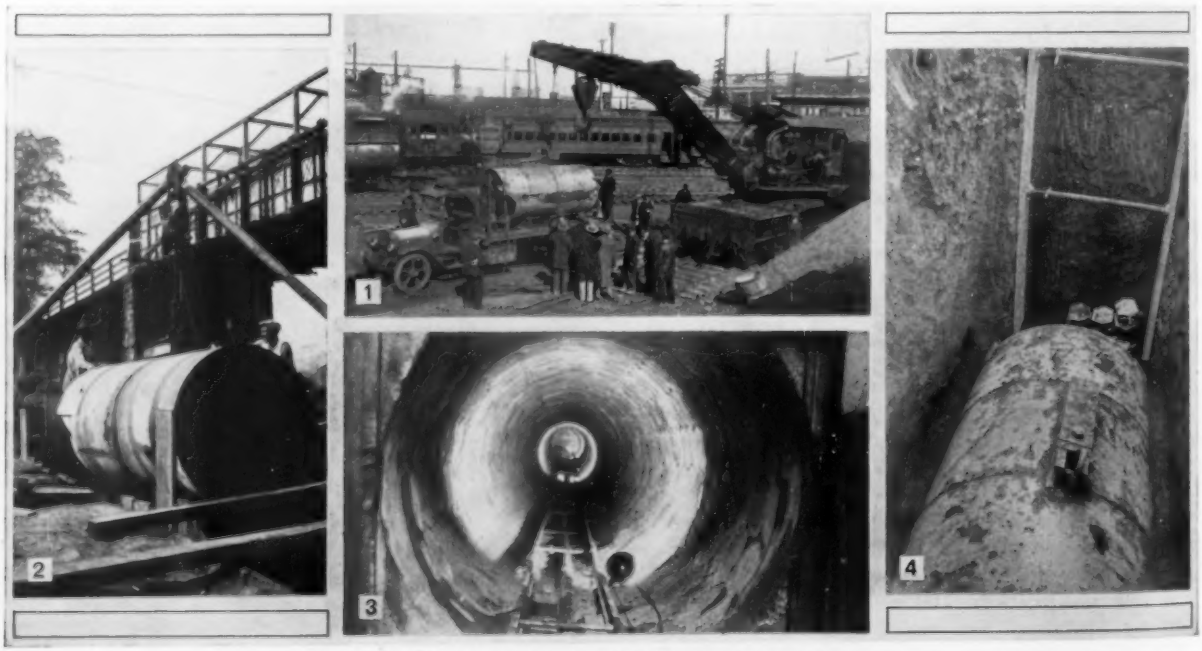
Tunneling to Increase Storm Sewer Capacity

By **FRANK B. TITUS**
Borough Manager, Lansdowne, Pa.

THE borough of Lansdowne in Delaware County, Pa., is a rapidly growing suburb west of Philadelphia. It was recently faced with the necessity of increasing the capacity of certain of its storm-water sewers. A survey disclosed that at one point a 4-foot conduit was necessary which would pass under the tracks of the Pennsylvania Railroad about 100 feet east of the Lansdowne railroad station and just at the end of the station platform.

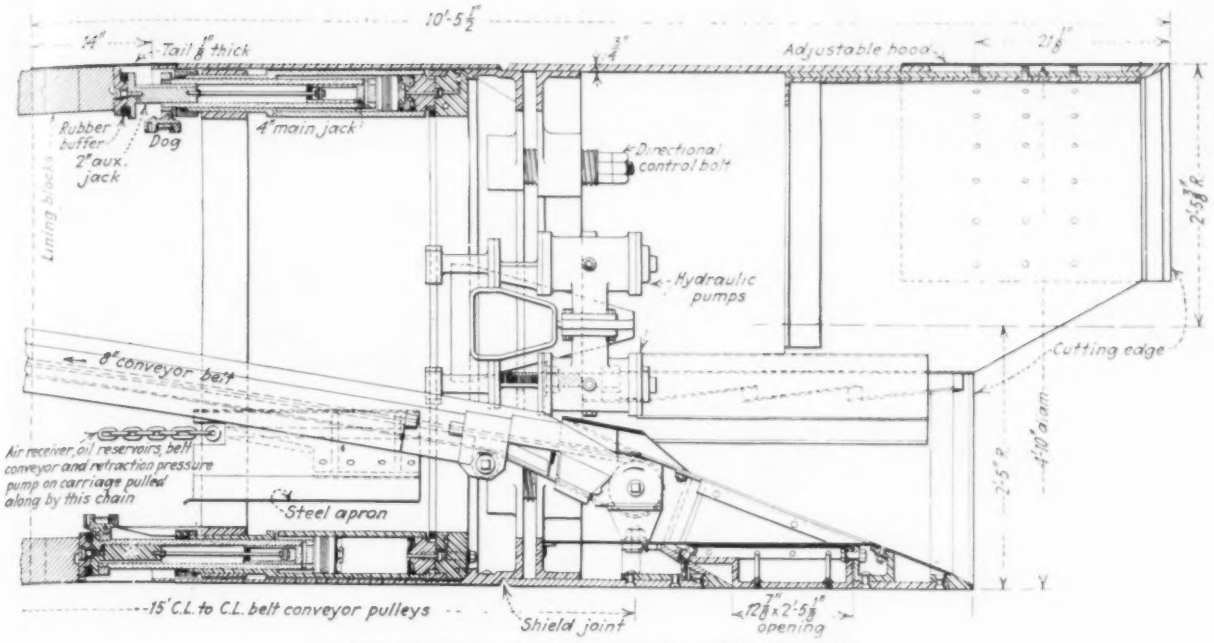
At this point there had been built at one time a series of coal pockets, with a 3-foot rough-stone retaining wall against the railroad right-of-way. These pockets had recently been converted into garages with concrete floors. Immediately opposite on the other side of the tracks was a yard used for the storage of cast iron pipe and enclosed with a 6-foot wire fence. The railroad right-of-way is about 50 feet wide; it is used by both steam and electric trains and is subject to heavy suburban traffic.

The Pennsylvania Railroad did not consider it safe to shore the tracks at this point so that an open cut could be made for the installation of sewer pipe. This with the other physical conditions mentioned above made it evident that some other method of working must be considered. Finally it was decided to use a T & M tunnel shield, which



HANDLING THE SHIELD FOR THE SEWER TUNNEL

1. Loading the T & M shield on a 5-ton truck for transportation to the job. 2. The shield in place at the tunnel ready for lowering. 3. The tongue-and-groove concrete block lined sewer as completed by the shield method. 4. The shield ready for removal at the completion of the job



THE TUNNELING MACHINE USED IN LANSDOWNE, PA.

met with the approval of the railroad engineers. This machine is designed to construct a tunnel lined with precast concrete blocks of special design, interlocking on all contiguous surfaces and having the joints filled with heavy asphalt before the blocks are set. The tube thus formed is rigid and watertight and, owing to the method of construction, there is no subsidence of the surface of the ground and no backfilling. This is a matter of great importance in working under railroad tracks and city streets.

Instead of advertising for bids and having the work done by contract, which would have caused considerable delay, the tunnel shield and the block-making equipment were obtained from the manufacturers on a royalty basis, together with two experienced machine operators and a foreman, who were placed on the borough payroll. The remainder of the labor was supplied from the regular borough labor gang, as only seven men were required, including the operator and foreman, for this machine. The concrete blocks were made near the site of the tunnel, in the borough storage yard.

During the progress of the tunnel work, two 3-foot-thick stone wall footings were encountered instead of the one known to exist, but these were successfully removed through the machine and a 61-foot tunnel completed under the tracks at a very reasonable cost. The section so constructed is connected to other mains laid in open cut where conditions permit. The advantages gained by the method adopted were the speed with which the work was undertaken and completed, the low cost to the borough, and the avoidance of all delay to trains and the commuting citizens of Lansdowne.

The Filling Station's Challenge to the Zoning Board of Appeals

IN a paper on "The Challenge of the Gasoline Filling Station," delivered in White Plains, N. Y., before the Westchester County Planning Federation on November 11, Paul A. Bankson, City Plan Engineer of New Rochelle, N. Y., reported the results of a recent detailed study of 86 filling stations in the four cities and several of the villages of Westchester County (representing 77 per cent of the county population), and a supplementary "reconnaissance survey" of several hundred additional stations in New York State and New England.

Answering the question, "Have Zoning Boards of Appeals failed to meet the challenge of the filling station?", Mr. Bankson stated that the survey had disclosed the following facts:

"1. In few municipalities has the Board of Appeals placed sufficient restraint on the desire, of the owner of vacant business property, to make temporary profitable use of the same as a filling station location.

"2. Boards of Appeals have been prone to grant permanent variances instead of temporary permits running for a five- or ten-year period. The result is a permanent depression in some localities perhaps beyond redemption.

"3. Boards of Appeals have not been stringent enough in imposing conditions as to width of entrances and size of billboards or signs, keeping pumps and structures toward the back of the lot, requiring attractive buildings and suitable planting."

Mr. Bankson recommends that every ordinance establishing a Board of Appeals should include as an item of original jurisdiction a provision giving the Board control over the issuance of permits for gas stations in business districts. With that jurisdiction, it should be possible to "so regulate stations that they become a community asset in addition to a profitable business."

Mr. Bankson also suggests that corner lot locations be discouraged, and that Boards of Appeals make annual surveys of gallonage sold, in order to determine future needs. New stations in separate new locations should be regulated by local needs.

For availability of the published study, see department of Municipal and Civic Publications, this issue.

Indianapolis Resurfaces Old Pavement with Concrete

By M. G. JOHNSON
Senior Assistant City Engineer, Indianapolis, Ind.

A BITUMINOUS treated macadam pavement, in fair structural condition but too rough to serve modern traffic, was recently resurfaced with 5 inches of concrete, on 46th Street in Indianapolis. At the same time the pavement was widened 12 feet, changing the old 18-foot road into a 30-foot street, and curbs were built along each side.

The bituminous macadam was built in 1926 at a cost of $2.42 per square yard. During the four years that it had been carrying traffic, it had been repaired four times at a cost of $1,000, making the average cost of maintenance $.10 per square yard.

Preparation for Resurfacing

Before the concrete resurface was laid, the macadam was cleaned, and trenches 6 feet wide were dug along each side to form a subgrade for the widened portion of the slab. Where the macadam was so badly broken down that it would not afford appreciable support for the new slab, it was dug out so that the concrete would be 8 inches thick at that point.

THE CENTER 20 FEET
of the 30-foot slab was built first and machine finished. The 5-foot strip along each edge was put in later and finished by hand

The concrete had a minimum thickness of 5 inches over the macadam, and the 6-foot strips outside the macadam were made 8 inches thick. In estimating the cost, it was calculated that the average thickness of the portions over the macadam would be 6 inches, to allow for variation in the grade of the macadam. The entire width was reinforced with wire mesh weighing 67 pounds per 100 square feet. Expansion joints were placed at 105-foot intervals, with contraction joints at 35-foot intervals between them. The reinforcement was not carried across the contraction or expansion joints.

A longitudinal dummy joint, ¼-inch wide and 2¾ inches deep, was made on the center line by a cutting wheel attached to the back of the finishing machine. The slot made by the wheel was immediately filled with a strip of premolded joint filler. The two halves of the slab were held together by ½-inch round bars 4 feet long, spaced 5 feet apart, extending across this longitudinal joint. The edges of the slab along the joint were rounded by edging to a radius of ⅛-inch.

THE COMPLETED PAVEMENT WITH CURBS

Finishing the Slab

The central 20 feet of the 30-foot slab was machine finished. The 5-foot strip left along each side was put in later and was struck off and finished by hand. This method is standard practice in Indianapolis and is used on practically all concrete pavement. Straight curbs 6 inches wide and 24 inches deep were also a part of the improvement and were built before work on the pavement started.

The section resurfaced is 5,200 feet long and was built by the Indiana Asphalt Paving Co. at a cost of $29,105.43, which is an average of $1.675 square yard.

LET CULTURAL ADVANCE AID BUSINESS PROSPERITY

To the Editor of The American City:

I was interested to read in your October number the article entitled "Public Works and Prosperity," in which David Cushman Coyle points out that new construction for cultural advance, and not for competitive manufacture, is America's urgent need. In this connection I think it is interesting to note the cultural advance which has been made in St. Louis during the last few years. Statistics prepared by the Industrial Club of St. Louis reflect an increasing appreciation of things cultural.

The number of books loaned for home use by the Public Library, for instance, increased 112 per cent during the period from 1915 to April 30, 1931, and the Missouri Botanical Garden, famed throughout the world for its collection of plants and flowers, attracted 392,642 visitors in 1930 as compared with 240,503 in 1915. Annual attendance at the St. Louis Art Museum increased from 168,962 visitors in 1915 to 307,155 in 1930.

THOMAS W. PARRY, JR.

St. Louis, Mo.
October 28, 1931.

Must the Consumer Pay for Private Fire Protection?

Abstracts from Memoranda Prepared by the National Fire Protection Association Presenting Both Sides of the Question

A STRONG, dependable water supply is essential to the fire safety of any community, but it is too common for a community not to provide adequate revenue for its water department or for the private water company serving it, with the result that the system is deficient in many respects. Another effect of such a policy is the attempt on the part of the water utility to make up for deficiencies in revenues by heavy charges against those who supply private fire protection in the form of automatic sprinklers, standpipes and the like.

The Case in Favor of Charging for Private Fire Protection

The following is an extract from a brief submitted by a water utility in a recent rate case and is typical of the way in which the case favoring charges for private fire protection connections would be presented. The reasonings of the courts and commissions as outlined here are not considered by the National Fire Protection Association to be sound, in many respects, as explained in the memorandum discussing the case against such charges.

The Courts and Public Service Commissions which have passed upon the question as to whether a company supplying water to special fire connections is entitled to receive a reasonable compensation for such service, have well pointed out some of the features which appertain to a special fire protection service. In the first place, a water company is under no legal or moral obligation or duty to supply free of charge water service for a private sprinkler system designed to safeguard private property. One installing such a system acquires a distinct individual advantage and, if such a system be connected to the distribution system of a water-works company, there is thereby imposed upon the water company a peculiar service, one which is entirely individual to the owner of the sprinkler system and for which he may be compelled to pay. If such service is rendered free, or inadequate rates are charged, it is clear that the difference must be made up by higher rates to be charged against general consumers. But, to require the other consumers to pay, either directly or indirectly, for this special service which is for the benefit of a limited class of individuals who have availed themselves of it, would be unfair and discriminatory. The benefit to the general consumer, if there is any benefit, is difficult to point out and may generally be said to be negligible.

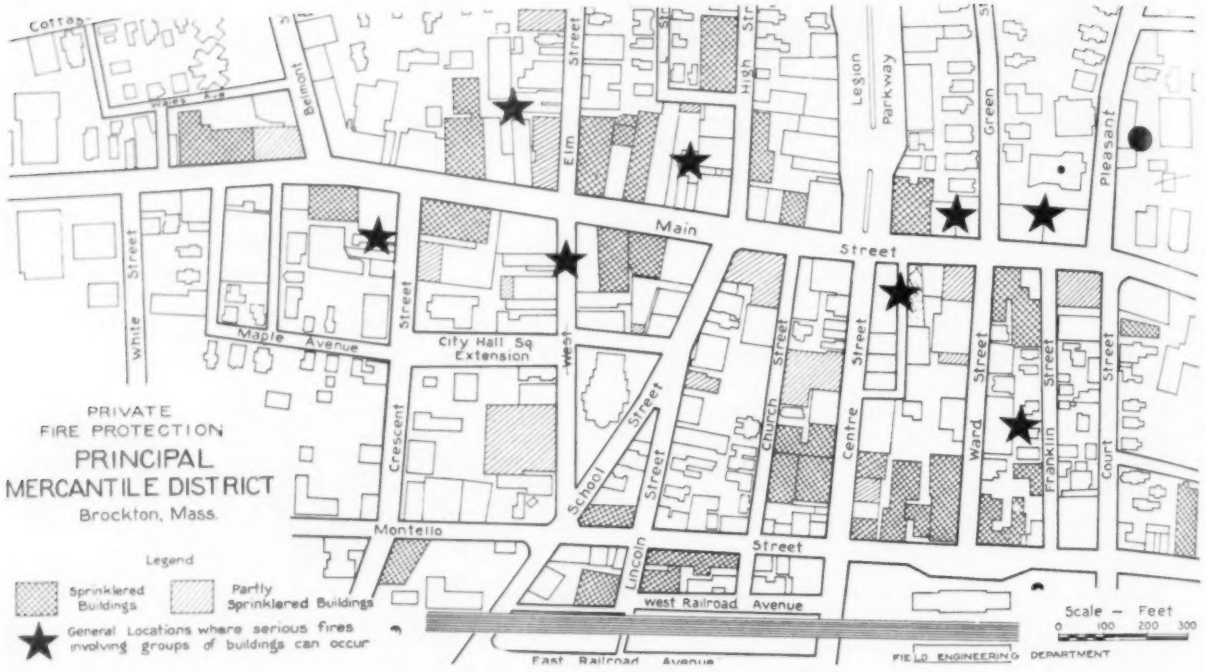
On the other hand, the limited class of individuals receiving the service is directly benefited in many ways. They may desire the service primarily to lessen the hazard of fire in and on their own property. They usually are the sole beneficiaries of the special fire protection thus afforded. Again, they receive a marked benefit which can be measured in an annual saving in dollars and cents, by a decrease in their insurance rates. This decrease in rates affects them only and not the general water-consuming public. The fact that for periods of long or short duration no fire occurs and no water is delivered for the extinguishment of a fire, is entirely immaterial. The value of the service is not and cannot be measured by a meter or by the amount of water actually taken. The demand is ever present and is entirely apart from either general demand or that of the hydrant system. When an automatic sprinkler system is in use, the water company must have a capacity equal to the combined general and public hydrant demands, with sufficient leeway to take care of the sprinkler systems. To say that such an additional capacity can be maintained by the water company without cost is based upon unsound theory.

WATER IS NECESSARY

whether for fire-fighting by public departments, as shown above, or by automatic sprinklers. The community must provide the water utility with sufficient revenue to enable it to supply water in adequate quantities and at adequate pressures

In answering the question of the justification of a charge made for private sprinkler head systems in the case of *W. J. C. Kenyon, Manager, Traffic Bureau, St. Joseph Commerce Club, et al. v. St. Joseph Water Company*, P. V. R. 1921 D, 590, the Missouri Public Service Commission said:

"The particular class of consumers receive special benefits by the use of the finished product of the defendant. Whether or not these customers receive this particular schedule service is wholly voluntary upon their part. They are all large business concerns and we assume they view the proposition as one being advantageous to them from a business standpoint or they would not accept the service. All principles of equity and scientific rate fabric adjustments accord with the irresistible conclusion that they receive special benefits and should pay a reasonable charge therefor. The amount of actual



EIGHT DANGER SPOTS IN A BUSINESS CENTER

water consumption they may utilize during the year for this particular service is wholly beside the principal issue involved. They secure the immediate benefit from fire loss by reason of their investment in these fire prevention devices, but not, however, until after they connect them with the facilities of the defendant. To furnish these facilities on the part of the defendant requires primary capital expenditure and, as well, operating costs, that sufficient pressure may be ready for them at all times to properly combat conflagration."

In another case, that of the *Portland Water District*, P. U. R. 1917 D. 907, the Maine Public Utilities Commission, in pointing out the justification of a charge and the special benefit to the user of the service over and above what the municipal fire protection affords the people in common, had this to say:

"That the equipment of buildings with inside fire service benefits the community generally by lessening the public fire hazard is the chief reason advanced in support of the claim that this service ought to be exempt from the payment of normal charges.

"The furnishing of private fire protection service by a water utility is one of its legitimate activities and constitutes an important part of the general scheme it is intended to serve. This service can no more be rendered without the existence of a complete plant than can any other service. The plant investment, upkeep and operation are as essential to this as to any other. As between this and the other classes of service rendered by the utility, there is no reason why either class should be exempt from carrying its fair proportion of the whole burden. There is no more reason for exempting owners of these sprinkler systems from meeting their proper share, than any other patrons of the city water works."

In the case of *Evansville Water Department*, 1923 C, 223, the Public Service Commission of Indiana was asked to authorize a charge for private fire protection connections. It was contended in behalf of manufacturers who had installed sprinkling systems that no charge should be made for connections serving such systems. They pointed out that sprinkler systems extinguish fires at their inception, that every drop of water thrown upon a fire through a sprinkler system saves the fire department from furnishing such water, that the immediate neighbors of the plant which has a sprinkler system are benefited in that the hazard of fire from the plant is reduced, that sprinkler systems are installed by progressive and prudent business men and that to make a charge for serving such sprinkler systems is in effect to place a tax on prudence and foresight.

On the other hand, evidence was introduced by the Water Department to the effect that the existence of the private fire protection connections in question entailed various and considerable expenses. The Department is compelled to maintain a system of inspection, as experience has proved that when inspection is not made periodically, tremendous amounts of water are consumed by the systems through leakage or, in some cases, unauthorized use. The Department further showed that most of the connections were 6-inch and that the entire system of mains leading toward the plants had been constructed on a larger scale, so that the private fire systems might be adequately served. A study of the historical development of the plant showed that, because of the existence of these private fire connections, the plant equipment was planned and installed upon a larger scale than would otherwise have been necessary.

In the case of *McFuson & Foster Company et al. v. City of Evansville*, P. U. R. 1925 E, 248, the petitioners stated that the annual charge made by the Water Department taxes only the property owner who would, of his own motion and at his own expense, protect his property from possible destruction by fire, thus reducing the city's burden of responsibility for fire control and lessening materially the city's peril from fire starting in a building not equipped for the automatic control of fire; that in thus equipping his building the progressive property owner puts in an effective tool which utilizes the city water sup-

ply in a more efficient way than is otherwise possible: that not only do the sprinkler owners pay their share of public taxes, but they also pay taxes at the regular assessed rates on account of increase in valuation of their plants, due to the sprinkler installations; that the charge for this water connection imposes an additional burden on the owner and is a discriminatory tax; that the system does not add anything to the readiness-to-serve burden of the water works; and that it does not increase the demand on the utility, but instead serves to decrease it.

The Commission did not agree with this line of argument, but compared the water utility with electric utilities, saying:

"While there are weeks and months in which many large users of electricity may not consume any current, it would be unjust and unfair to require the public utility to be prepared at all times to furnish them such service without applying the ready-to-serve charge. The automatic sprinkler charge made in this case is based upon the size of pipe used; the larger the pipe, the greater the cost of service rendered. If the petitioners' contention be reasonable that no charge be made if no water is actually consumed, then would it not have been to their financial advantage to install the 1-inch equipment? Certainly, there should be a reasonable charge not only for the immediate use but for the privilege of using as large a quantity of water as possible at the highest pressure."

The Minnesota Supreme Court, in one of the leading cases upon the subject, that of *Gordon et al. v. Doran et al., Board of Water Commissioners*, 100 Minn. 347, 111 N.W. 272, 8 L.R.A. (M.S.) 1049, held that a property owner who has installed an automatic sprinkler device and connected it to the water mains at his own expense, although he may not take the water except in case of fire, enjoys a beneficial use of water not common to the public in general, and the Water Board, therefore, is entitled to make a reasonable charge for the pecuniarily valuable and special privilege conferred; saying:

"So long as water supplied for protection against fire is a purely public service under the control and management of municipal authorities generally and under the fire department specifically, no direct charge to individuals is proper. When, however, a sprinkling connection is made with private premises, the situation is materially different. These premises and the primary causes of catastrophe to the building and of the consequent possible use of large quantities of water are primarily under the control, not of the public, but of the owner. A peculiar personal service is provided for his benefit which is not enjoyed in common by the community in general, but is available only to a limited class of individuals. The property owner beneficially employs the water mains for his own purposes and to his own advantage, although he may not, except in case of fire, actually draw any water from the pipes. It is necessary and proper that for this he should pay."

The Supreme Court of Iowa followed the above decision in the case of *J. W. Edgerly & Co. v. City of Ottumwa et al.*, 156 N.W. 388, and held that the proprietor of a building who installed an automatic sprinkler system, intending to put out fires before they could gain headway, derives a benefit from the system in fire protection and reduced insurance rates and, although the general public benefit in reduced fire hazard, yet a municipal water-works system to which the sprinkler is attached performs services and stands ready to perform others for which charges may be made.

Other cases in favor of charging for this service are *Pittock & Leadbetter Lumber Co. et al. v. North Coast Power Co.*, P. U. R. 1920 F, 384, 386; *Terre Haute Paper Co. v. Terre Haute Water Works Co.*, P. U. R. 1924 B, 580; *Loveman v. Water Works*, 1. Term. Ch. App. R. 696; *Schwarzenbach-Huber Co. v. Hackensack Water Co.*, P. U. R. 1926 A, 701; and *Cox v. Abbeville Furniture Factory*, 75 So. Car. 48.

The Case Against Charging for Private Fire Protection

Private fire protection is an essential factor in the adequate control of the fire conditions which at present cause our tremendous national fire losses. Charges for private fire service connections operate to prevent installing such protection, and are therefore considered by fire protection authorities to be contrary to best public policy. It should be kept in mind that in presenting the case against charges for private fire protection the National Fire Protection Association and fire protection authorities generally favor adequate revenue for water utilities so that both public and private protection facilities may be satisfactorily maintained. If this is done, charges for private protection should be unnecessary.

It is apparent that in the decisions of courts and commissions on the subject of private fire service connection charges, an assumption, which is in itself not borne out by the facts, forms the basis for the decision, namely, that in order to provide for connections to automatic sprinklers and other forms of private fire protection, it is necessary for the water works to make proportionately larger investments in plant and equipment. If the assumption is true, it means that the municipality is in effect saying to every taxpayer: "We are not planning to provide a thoroughly adequate water-works system for fire protection in return for your tax payments. We will build a system just big enough to take care of a majority of the voters, and others to whom it is not so convenient to supply protection will have to shift for themselves or, if they want protection, will have to pay us especially for it." Obviously, no municipality intends to do this. It is their intention to furnish adequate water for fire protection to every taxpayer. If they do not, they are making some taxpayers pay for a service they are not getting. The taxes paid by any business building or manufacturing plant are proportional to the value involved, and they are therefore entitled to a water service as nearly as possible proportional to the taxes paid.

Therefore, any water works is either by reason of its charter or contract with the city obligated to bring adequate water for fire protection to the door or within a reasonable distance of every building in the city.

In a brief submitted by a water-works company, it was asserted that it was under no obligation to supply, free of charge, water for a private sprinkler system. The fact of the matter is that it is obligated to bring the water to a point near the building and in sufficient quantities to enable the fire department in the event of fire to control it. Should the owner desire to make use of this water through a private sprinkler system, it should be kept in mind that this will actually reduce the demand on the water works, especially as to the quantity of water necessary, and will not require any increase in plant or equipment. If, in a particular case, in order to furnish an adequate water supply for a sprinkler system, it is necessary to lay addi-

tional mains or to increase pressures, it simply means that the existing equipment is not adequate for fire department use in the first place.

Another statement made is that the benefits to the general consumer of water from the installation of sprinkler systems are negligible. This is hardly true when one realizes that every sprinkler system installed reduces the potential demand on the water-works system, lessens the wear and tear on the fire department, and reduces fire losses, which in turn brings about reduced insurance costs to the general public.

The proportion of the investment in plant and equipment of the water works for fire protection should be taken care of, therefore, through funds raised by taxes or by a system of water rates distributing the cost of the system to the whole body of taxpayers.

With reference to specific cases, it is obvious that the Courts and Commissions have been impressed by the water companies' statement that in order to serve sprinkler connections they have been obliged to make additions to plant and equipment. In one case involving a decision of the Indiana Public Service Commission, it is admitted that its decision is based on an assumption that to furnish private fire protection service the water company must correspondingly increase its capacity, but states that actual proof of that condition is absent.

A decision of the Public Service Commission of Pennsylvania states:

"The Commission is of the opinion that no extra charge should be assessed for private fire protection service, provided the individual or individuals receiving this service assume the entire cost of installation and maintenance of the connection to the city's system. Under these circumstances, to collect an extra charge must certainly amount to double taxation, since the proper proportion of the capacity cost of the water works is always included in the public fire protection charge, and the payment is made by the borough or municipality out of the general funds raised by taxation."

Another argument is that in various ways the property owner to whom a private connection is given is directly benefited. One decision on this subject states:

"Of course the amount of water used should be taken into account, as well as any saving to the utility by reason of the saving on the general hydrant system in event of fire, but no element of benefit to the owner of the property should be taken into account."

In other words, the Court felt that any benefits such as lower insurance rates which were obtained by the property owner were immaterial so far as the question of charges for the service were concerned.

In giving a connection to a private fire line, the water company customarily charges the property owner for the installation cost, and the only additional expense to which the water company is subjected by reason of the presence of that connection is on account of a relatively infrequent inspection which must be made of the connection to assure the water company that water is not being used for an unauthorized purpose. It is felt that a nominal fee to cover the cost of reasonable inspections of the service connections is justified, but that this fee should be in the nature of a charge for actual supervising services, and not in the nature of a charge for revenue. The cost of this supervision of private fire service connections is so small that a great many water departments make no attempt to charge the individual owner, but feel that, because of the public benefits from sprinkler systems, they can well afford to let this item of cost be covered by the general tax or rate payers.

EDITORIAL NOTE.—An investigation of the subject of charges for private fire service was recently made by a committee of the Fire Waste Council of the Chamber of Commerce of the U. S., which expressed its findings in a pamphlet, "Water Charges for Public and Private Fire Protection."

Meters Should Fit the Need—Not the Pipe

By **H. G. BROWN, JR.**
Engineer, The New Rochelle Water Co., New Rochelle, N. Y.

AT various times the writer has noted in water-works magazines articles which told of the use of recording devices on metered services to determine the suitability of the meters for the work to be done. By the use of one of these recorders a chart is obtained from which can be computed the maximum rate of flow through the service during the period of the test, and this will show whether the meter is too large, too small or well suited to its requirements.

Another method of determining the suitability of meters which apparently is not so well known but which has been used with some success by the New Rochelle Division of The New Rochelle Water Co. is described in the fifth edition of the American Civil Engineers' Handbook in the section on Water Supply, which says in part: "The load factor of a meter is the percentage which the average sales from it are of the capacity shown in the . . . . last column of the following table. [Ed. Note: Table reproduced on p. 83.] Thus a 2-inch meter recording 40,000 cubic feet per annum is said to have an 8 per cent load factor (40,000/5,000,000 = 0.08). . . . The average load factor on ⅝-inch meters in an average system will be between 1 and 2 per cent. Much slippage or loss of water passing without registration is inevitable because of the low load factor. Smaller meters, if made, would not deliver water fast enough. The ¾-inch meters used on large houses are in an intermediate position. In all other cases meters are best placed of the smallest size that will give the discharging capacity actually required by the taker. If rigidly held down by this rule, an average load factor of all meters 1 inch and over of 15 or 20 per cent may be realized. If the rule is less rigidly enforced, lower load factors will result and more water will pass without registration. In general, any meter 1 inch and over with a load factor below 8 per cent should be at once replaced with a smaller one. Protector meters and compound meters are used where large capacity is essential and where ordinary use results in a very low load factor."

Moderate Rating of Disc Meters with Loss of Head Not Exceeding 5 Pounds

Nominal Size Inches	Manufacturers' Rating, Gallons per Minute	Gallons per Minute	Velocity in Pipe of Exact Diameter	Millions Cu. Ft. per Annum Running All the Time
⅝	20	7.11	7.44	0.50
¾	34	12.09	8.78	0.85
1	53	21.33	8.72	1.50
1½	100	42.67	7.45	3.00
2	160	71.1	7.26	5.00
3	315	142.2	6.46	10.00
4	500	213.3	5.45	15.00
6	1,000	426.7	4.84	30.00

Putting the Plan to Use

The New Rochelle Water Co., probably in common with numerous others, used to provide meters of the same size as the service pipes upon which they were set. In other words, a 1-inch meter on a 1-inch service, a 2-inch meter on a 2-inch service, etc. This, of course, resulted in the use of a number of meters which were too large for the work they had to perform. By going through the meter reading books and computing the load factors for disc meters 1 inch and larger in size, many have been found with factors of less than 8 per cent and some with factors as low as 2 per cent. Each case is considered separately with regard to pressure available, number and nature of complaints, if any, presence or absence of flush valves, and any other pertinent facts. If there seems to be no good reason for not doing so, the large meter is then replaced by a smaller one. In one case a 1½-inch meter with a load factor of 6 per cent was replaced by a 1-inch meter, which showed a load factor of 13 per cent. In another instance a 1-inch meter with a load factor of 2 per cent was replaced by a ⅝-inch meter, for which the load factor was 7 per cent. Even though the percentage of registration is not increased by using the smaller meters, the capital investments in those particular services are reduced, which is certainly to the advantage of the water company and also, indirectly, to the consumers as a whole. The rule now is that only in cases of actually proved necessity will a meter as large as the service pipe be permitted.

Opening New Streets in Salt Lake City

Cuts Up to 22 Feet Deep Handled by Bucket Type Loader

EXCAVATING WITH A BUCKET LOADER

Showing character of gravel bank after shooting, and method of loosening material with a rod

IN common with many other cities which have foothills near the outskirts, Salt Lake City, Utah, has been faced with the problem of economically moving this earth in order to open new streets, and at the same time to use this dirt to good advantage in the construction and maintenance of its graveled roads. The work has usually been done with a 1-yard shovel loading to trucks which hauled and placed the material where needed. Inasmuch as a great deal of the work is done under conditions which preclude the use of such heavy equipment, and inasmuch as the work is often located in widely separated parts of the city, the City Commission decided on the use of a bucket loader which could be easily transported and yet could in some measure approach the performance of the shovel previously used.

A Link-Belt grizzly loader was installed and put to work making a cut in one of the foothills in the northern part of the city, partly to open the street and partly to obtain material for the filling-in and resurfacing of other streets. The material is first loosened with occasional shots of explosive and then loaded directly into trucks. After having been shot, the mixture of gravel and clay is further broken up by one man with a long steel rod working directly in front of the helical-ribbon digging and loading device on the machine.

The feeder delivers the material to the elevator bucket, and as the material falls into the truck body, it passes over a screen which separates stone over 1 inch and fines under ½-inch, from the gravel which is to be placed on the streets. When no screening is required, straight loading is accomplished over the same screen, but with the upper bar screen removed and a flat plate which acts as a chute substituted.

Although the cut has varied up to 22 feet, and the total yardage removed has run well over 4,000 yards, the loader has kept the trucks busy loading about 7 cubic yards of material in 2 minutes and 45 seconds.

Warning—Ice and Snow Ahead—II

Properties of Ice and Snow Which Must Be Considered by Officials in Charge of Snow Removal

By **JOHN H. NUTTALL**
Consulting Civil Engineer,
Philadelphia, Pa.

Conditions Following Storms

Wet snows of less than two inches in depth which fall at comparatively high temperatures melt quickly even where traffic is light, and produce but little slush during melting. Snows of this character do not remain on the ground long, unless lower temperatures occur immediately after the storm, in which case the snow is rapidly transformed into ice. Dry snows of less than two inches in depth which fall at low temperatures are usually scattered by traffic and driven to the gutter, unless high temperatures follow the snowfall, in which case they are melted quickly. A shallow snow of this character which has acquired its final depth only after a long fall is sometimes compacted into a solid sheet by traffic.

The time required for the melting or diffusion of shallow snow is dependent upon the quantity of traffic and the number of curves which the traffic makes, as well as upon the temperature. Such snows are quickly removed from the street by rain.

Deep, wet snows are rutted by traffic and pushed to the side of the street, with the production of much slush. Where the traffic is light, such a snow will be merely rutted. A slushy condition will be intensified by rain, and the rutted surface may be transformed into solid ice by low temperatures. Deep, dry snow produced at low temperatures is compacted by traffic into a dense mass, which is later worn into ruts. The different conditions which may follow a snowfall are many, depending upon the temperature, the precipitation, the character and density of traffic and the number of turns made by traffic.

Snow left in piles gradually becomes surrounded by a hard crust, which is formed by the melting of the outer surface during the day and re-gelatination during the night and freezing weather. The bottom of the pile is transformed into honeycombed ice by pressure and re-gelatination, but the inside, which is insulated by the outer layers, remains comparatively soft for long periods.

Formation of Ice

Snow is compacted into ice by the pressure of traffic. The snow particles are pressed together, which results in the melting of the outer surface, and freeze together when the pressure is released, forming honeycombed ice of varying density, depending upon the temperature and the quantity and weight of traffic. Periods of high temperature followed by cold facilitate freezing and the formation of denser ice, as the melted water during the warm periods fills the air spaces, where it is afterwards frozen. The same condition is produced by freezing temperatures following rain. The ice produced by these conditions varies from compacted snow to solid ice.

Ice sometimes originates on the surface of the street in the form of hail, but this usually occurs in comparatively warm weather and the ice is soon melted, although many heavy falls occur.

The water in gutters freezes quickly when the temperature is low, because of the shallowness of the gutter. Water cannot freeze until the entire body has been lowered to the temperature of 4 degrees C, which is the temperature of the minimum density of water. Water is cooled at the surface, and the cooling causes an increase in density of the surface water, which falls and is replaced by warmer water from beneath, thus causing circulation through the entire body of water until it has all reached the same temperature, after which circulation ceases and freezing may occur. A small, shallow body of water is cooled to the freezing point more quickly than a large, deep body and consequently freezing occurs more quickly in shallow bodies than in deep. It is for this reason that gutters containing small bodies of water freeze and melt so quickly. Freezing is sometimes retarded by such materials as soap and alkalies in solution where the water in the gutter is the result of house drainage.

Rain water is pure and freezes quickly. Water from rain is frequently frozen in depressions and holes in the street and sidewalks, and a thin sheet over the entire street is often caused by rain which is frozen during or immediately after fall. A sheet of ice may also be caused by the freezing of a thin sheet of wet snow.

Ice may originate on streets or sidewalks by the freezing of water from running hydrants in yards or on the streets. Ice of this character is often quite dense and composed of successive hard layers. Drainage from houses, yards and roofs is often frozen upon the street. Ice from drainage water is often dirty. Street inlets which may be choked or in which freezing occurs may cause the formation of a pool of water which is frozen by low temperatures. Such pools are often of large extent.

Ice also originates from water which has dripped from defective fire plugs or is caused by the breaking of the

plugs. Large quantities of ice may be produced upon the street by the breaking of water mains during freezing weather. This may be responsible for the worst ice condition upon the street, as the breaking of a large main may flood many blocks and produce ice covering the entire street surface to a depth of several inches.

Minor sources of ice are from water used in extinguishing fires, from defective radiators on automobiles and the drippings from vehicles carrying garbage, ice cream and other substances. Ice formed upon the surface of the street is often porous and rapidly becomes covered with dirt.

Disappearance of Snow

Snow is composed of minute particles of ice which are in contact. Pressure and heat melt the contact surface of the individual pieces of ice, and freezing temperatures following cement the particles together. The entire mass may be compressed by varying degrees of pressure into what may be described as fine honeycombed ice with a high proportion of air voids.

Snow and ice melt by direct conduction of heat from the ground, air and rain. Heat flows from the warmer to the cooler substances, until the temperatures of both are equal. The rapidity with which the heat is transmitted is directly dependent upon the difference in temperature between the two bodies and the areas of the surfaces touching, which accounts for the speed with which snow is melted after falling upon warm ground in the spring and fall. The same is true where snow falls upon surfaces which are of a higher temperature than natural soil or paving, such as the surfaces of vaults and shallow sewers.

Snow is melted by the transfer of heat from the air, which continues until the temperature of the air in contact with the snow is lowered to that of the snow. Cold air is heavier than warm air, and air which has been cooled to the temperature of the snow will remain on the snow surface and prevent the transfer of more heat from the warmer air above unless it is removed. The cold air is removed and replaced by warmer air on windy days, so that snow and ice melt quickly in windy weather. The melting of snow and ice by air in motion is also accelerated by the fact that air in motion striking a cooler body parts with more heat as the speed of motion increases. Moist air in contact with snow melts the snow more rapidly than dry air, as the contained water vapor contains more heat for equal weights than air, and damp salt air melts snow and ice still more quickly, as the salt lowers the melting point.

Snow conducts heat less readily than solid ice, as the voids in the snow are filled with air, which is a much poorer conductor of heat than ice. The melting of snow is accelerated by diffusion caused by traffic or other reasons, for greater surfaces of snow are brought into contact with air and radiation from which heat may be absorbed. Dirt is usually a better conductor of heat than ice, and heat is conducted more quickly through dirty than through clean ice or snow. Heat conducted by the dirt will melt the ice or snow immediately around the dirt, and air will enter the holes thus opened and accelerate the melting of the entire mass. Water has the capacity of holding a large quantity of heat, and warm rains melt snow and ice rapidly. The water also brings the heat into contact with the snow by opening passages through and under the mass.

The pressure of traffic has little effect upon the melting of snow or ice, as the melting point is lowered only 0.0133 degrees F for each atmosphere of pressure. The allowable weight limit for vehicles in many states is 800 pounds for each inch of tread and assuming each inch of tread to represent one square inch of surface, which is conservative, the resultant lowering of the melting point is only 0.7 degrees F. The melting of ice and snow which is observed as a result of traffic is accomplished by the scattering of snow by the wheels of vehicles and also the formation of heat by the slipping and sliding of tires. Traffic may accelerate the melting of snow and ice by scattering or may retard it by compressing.

Snow and ice may be melted by the absorption of radiant heat from the sun even when the air temperature is considerably below the freezing point. Radiant heat acts with the speed of light and is absorbed by different substances in different degrees. Very little radiant heat is absorbed by air, which may remain cool when solid bodies which it surrounds are heated to a considerably higher temperature by the absorption of the radiation. Ice and snow absorb more radiant heat than dirt, and consequently the melting is retarded by even a thin layer of dirt upon the surface. The melting of snow or ice by heat radiated from the sun is greatest in spring, when the sun's rays are received more directly upon a level surface, and snow rarely remains upon the ground for a long period in the late winter, in spite of continued low temperatures. The sun's radiation is screened by clouds, trees, buildings and other objects that throw shadows, and snow lasts for a much longer time when it does not receive the direct rays of the sun.

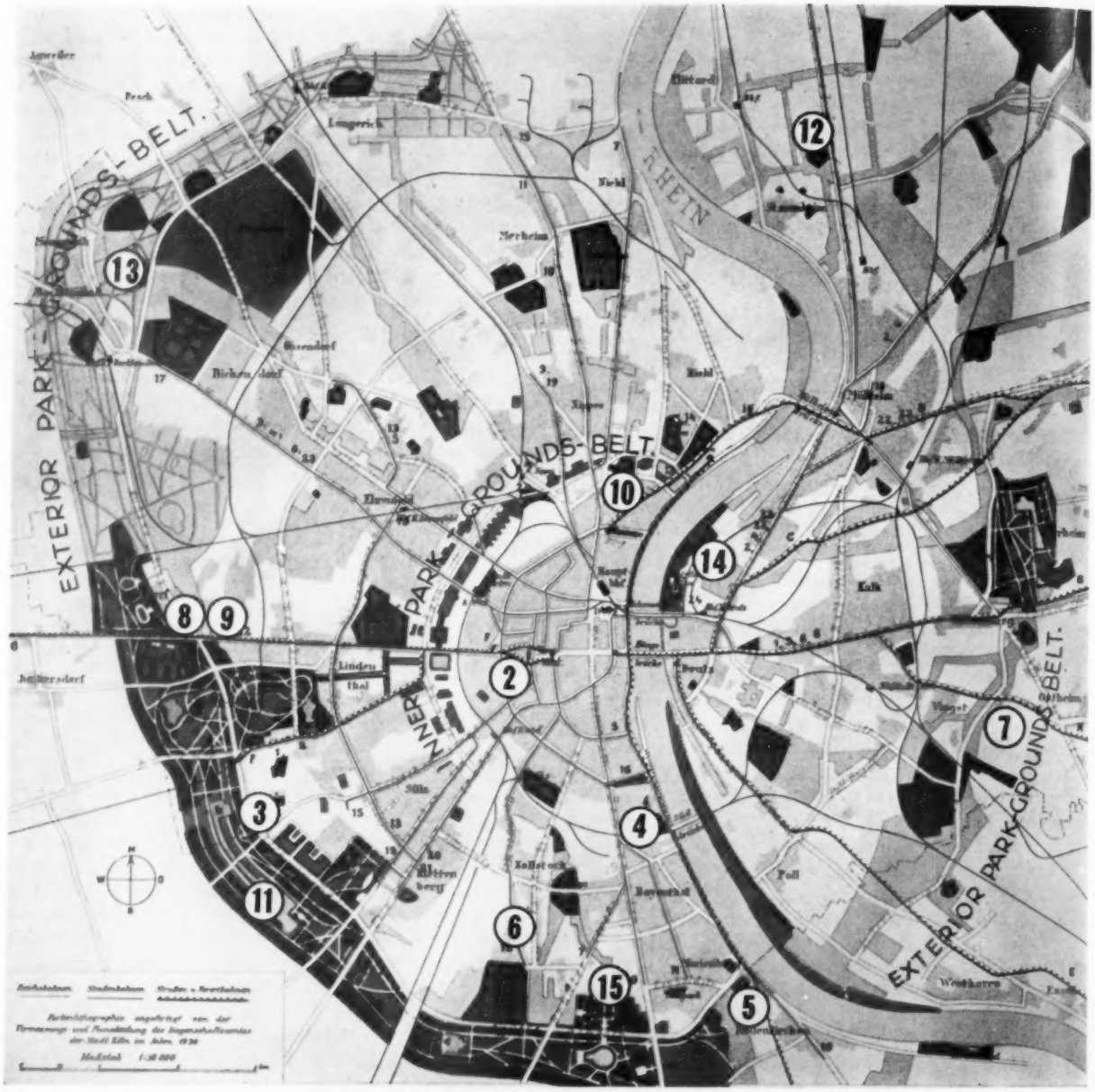
Ice and snow not only melt but sublime, or pass directly from the solid to the vapor stage. This action takes place at temperatures below freezing and is accelerated by dry air and low atmospheric pressure. Saturated air is heavy and tends to blanket snow and ice and prevents the absorption of vapor by dry air, so that sublimation proceeds more rapidly on windy days. Sublimation is retarded or stopped entirely by a covering of dirt.

The melting of snow upon the surface of the street is accomplished by a combination of all those factors, and no estimate of the time required for the melting of any given amount of snow is possible. A knowledge of local conditions is of some value but, aside from the fact that snow upon the sunny side of streets, particularly where exposed to the prevailing wind, melts more quickly, is of little practical importance.

EDITORIAL NOTE.—The third and concluding portion of this thoroughgoing article on ice and snow—enemies to winter traffic in city and country—will consider the reasons for snow removal, the responsibility for the work, and its scope.

NO HOLIDAY ACCIDENT

THE first accident-free holiday campaign in San Francisco, Calif., in 1930, was so successful that the Law Enforcement Board in cooperation with the Police Department decided to make it an annual occurrence. The results of this effort are considered largely responsible for that city's having the best holiday-accident record of any large city in the United States, according to William J. Quinn, Chief of Police.



1. MAP OF COLOGNE'S RECREATION PLACES
The illustrations are numbered to correspond with the numbers above

Parks Replace the Ramparts of Cologne

By ARCHITECT FR. WILDEMAN
Cologne

Photographs by Inspector W. Kittmann

IN contrast to Berlin as a small village of farmers and tradespeople in the Middle Ages, Cologne, with 40,000 inhabitants, has been, through centuries, in area also, the largest German town. The fortifications enclosed large areas of gardens and vineyards, and therefore a reserve space existed until 1880 for the growth of a modern town.

By 1880 the reserve space had become exhausted. The town walls and gates of the Middle Ages had been blown up. A new town, modern according to the ideas of the times, had been laid out, about 2,000 feet wide, in truth an unhealthful bulwark of stone, about 5 miles long, without sufficient recreation space, surrounded with a chain of fortifications. At the same time, politically independent suburbs were growing throughout the region, with the danger of involuntarily combining as an uncoordinated

stone mass of tremendous area. But this danger was effectively averted just in time by the incorporation of communes during the years 1888, 1910 and 1914.

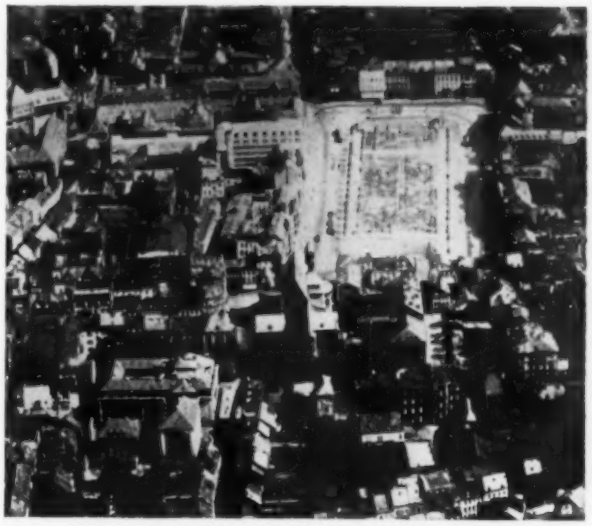
Between this ring of suburbs and the city of Cologne, by 1882 completed and newly fortified, existed an inner strip as a circular free zone, the "Inner Ring," not built upon because formerly used as the artillery field of the forts. Corresponding to this on the outside of the suburbs was a somewhat less compact but much longer circle of fortifications, of 25 miles, on the right and left of the Rhine, with an average width of 3,000 feet—the "Outer Ring." It was built a few years after the Franco-Prussian War of 1870-71 and further equipped with modern military buildings at the beginning of the World War in 1914. These recent additions, as far as they had any relation to modern warfare, were destroyed, without exception, in 1920 by order of the English garrison in virtue of the treaty of Versailles. Cologne, until this time the greatest stronghold of Germany, has ceased to be a fortification.

What should be done with the remaining old types of fortifications? They were so worthless from a military point of view that the English army considered it unnecessary to destroy them. Spread out over the two concentric circles around the city, most of them contained small, thick woods, which formerly served as a protection against the enemy and as a place of concealment for cannon dealing out murder and destruction. Could they be put to any other use, in the way of welfare and peace? Cologne has found the answer to this question, and with a strange irony of expiation, outstanding in the history of large Continental cities.

The Green Girdles

The narrow-chested, stony Cologne of 1919 without doubt needed adequate lungs. Except for a few older parks, almost no natural forests existed on the left bank of the Rhine in the outskirts of the city. The woods on the western hills have been more and more absorbed by the brown-coal mines there. On the right side of the river extensive forests lie close to the city limits. It was therefore impossible to use the forests in any immediate scheme of city planning. This caused Dr. Adenauer, Lord Mayor of Cologne, to provide, through two statutes, of 1919 and 1920, that half of the "Inner Belt" and nearly all of the "Outer Belt" should be kept, as before, free of any kind of buildings, and should become continuous green girdles. The inner green girdle was essential as a breathing-place for the all too compact old city, in order to prevent the decline of the population. According to a plan by Professor Schumacher, of Hamburg, in 1923 a continuous green ribbon of parks and public gardens was laid out, temporarily excluding the bordering building areas. The landowners were obliged to give 50 per cent, instead of the usual 35 per cent, of their areas for streets, public places, and parks, but will be compensated therefor in the future by being allowed to put up higher buildings.

Immediately after the war Germany already had a large number of unemployed. Public relief was given them, for the most part without any return in service. This was otherwise in Cologne. The recreation areas required extensive earthworks, for which unskilled laborers were qualified. They received for this a small advance from the weekly public relief. As a result, the city made a great saving in the cost of completing her green areas—a prominent and especial credit to the Lord Mayor, Dr. Adenauer. Noteworthy examples of landscape architecture in the green belt are the terraces of the old fortifications, some of which are shown in illustration 4.



2. CENTRAL AREA OF THE OLD CITY

With the completion of the outer green girdle it was now possible to work on the basis of the law of 1920 and of the comprehensive plan of the city landscape department. The areas between the outer fortifications in 1919 belonged for the most part to private persons; they were

3. RUINS OF FORT DECKSTEIN
Profuse rock-garden planting has created a place of reposeful charm

4. FORMER FORT, HINDENBURG PARK. 5. ROSE GARDEN, FORT MARIENBURG. 6. HOUSING DEVELOPMENT, COLOGNE-ZOLLSTOCK. 7. PLAYGROUND ON THE RHINE (RIGHT BANK). 8 AND 9. THE COLOGNE-MUNGERSDORF STADIUM AND SWIMMING POOL. 10. INNER GREEN GIRDLE, FORMERLY FORT X. 11. SAILING AREA NEAR FORT DECKSTEIN. 12. BALL GAME IN FORMER RAMPART DITCH. 13. SCHOOL FOR WEAK CHILDREN IN FORMER FORT

used for agriculture and, on account of artillery practice, had never been built upon. Threfore their value, as farm land, was low, and it was possible during ten years of persistent city development for the city to acquire this property through exchange or purchase. While the work is nearly completed on the left side of the Rhine, on the right side the conditions are more difficult. The problems involved were of many different kinds.

14. EXHIBITION GROUNDS
The Rhine is shown at the left, and on the wall of the former fort is a restaurant

For Beauty, Health and Welfare

Illustration 5 shows still another example of remodeling, similar to that in illustration 10. Here on the large earth-covered roof of an old casemate a rose garden has been made, the whole very effectively surrounded by an acacia grove that once served as a military shelter. Illustration 3 shows an arch of reinforced cement which was blown up by the English and on which an Alpine garden has been skillfully laid out. Illustration 11 discloses another section—the water surfaces. Till now there have been none such within the land area. Their artificial construction has given for the second time a most welcome opportunity, in moving many million cubic meters of earth, to give relief by employing ten thousand hands in worthwhile work.

Further happy transformations of these war structures, once serving to protect, but also to destroy, human life, and also of some of the tall forests, are shown in illustrations 13 and 15. In several places frail children are having six-week school terms in the fresh air of the woods. The old military barracks now provide kitchen, dining-room, schoolroom for bad weather, and rooms for the teachers. In other places there are open-air baths for sick children. Thus a school of landscape gardening serves in its turn the cause of professional education.

The Raderthal public park (Ill. 15), in the southern part of the city, has been constructed on the former site of a large munitions camp. Four of the twelve great circular earth walls that guarded the stores of powder have been preserved, with their trees, and now serve as wind-protected playgrounds and gardens. Out of the eight remaining earth walls a little hill with a natural theater has been made. The whole development makes an excellent setting for the Cologne radio station. On the right-hand edge of illustration 15 can be seen the 25-mile connecting street which even today bears the name of Miltary Street.

The Cologne stadium leans against the ruins of an old fortification. On account of the great extent of all its sport facilities, it had to be predominantly a new development. But it is noteworthy that its construction was carried out on the same basis as that of the exterior green girdle: first, through the low value of the land, most of it being in the area of the fortifications; and also because of the low cost of construction through public aid to the unemployed. Of illustration 8 it may be said that the rows of seats in the amphitheater are of the green turf and that the green stadium is in the pleasantest way a part of the natural growth. The need of substantially enlarging sport areas is a result of the war, upon public health.

For the landscape details of the inner green girdle according to the comprehensive Schumacher plan and for the stadium, responsibility rested with Landscape Director Encke, who has also laid out a number of modern parks. The planning of the outer green girdle and the completion of other planting plans are in the hands of his successor, City Architect Nussbaum.

The City Planning Situation in Greater Cologne

From the foregoing it is easy to realize that, instead of the old concentric form, a radial, more open, decentralization has been carried out. The general city plan is not a model to be brought to completion at a definite time.

15. A PUBLIC PARK IN COLOGNE-RADERTHAL
The Cologne radio station is shown in the foreground

On the contrary, it is steadily, carefully, adapted to changing conditions of growth, step by step, towards realization. At the moment the legal basis for public policy in Germany regarding recreation spaces is not uniform. There is no comprehensive town-building law. But Cologne has a better opportunity than other large cities to realize its aspirations in an economical, definite, liberal development, because more than 40 per cent of the area of the whole city is the property of the municipal administration.

In the spring of 1929 a new zoning law was passed. Its author is the present head of the city planning board of Cologne, Building Director Arntz. Also, in traffic facilitation there is much activity. Several rural planning boards are cooperating. In 1928-29 the Lord Mayor of Cologne erected a fine suspension bridge over the Rhine to the suburb of Mulheim. South of the city, in the direction of the city of Bonn, Germany's most modern motor highway is nearing completion. The right bank of the Rhine, directly on the river, with its historic city view, is enriched by a museum and magnificent exhibition halls, a great attraction for foreigners. A new University building will soon be finished, which promises to be the most modern type on the Continent. Building construction has been especially active in housing. There are—it is a pity—fewer one-family houses. Up to the present time apartment houses have predominated. Illustration 6 gives an example of these. But in view of the continued financial depression in Germany, action has been taken by the national government to build less-pretentious houses, some of them of the bungalow type, with larger gardens and little farms, as in many other countries for a long time past.

Why Cleveland Abandoned the City Manager Plan and Will Probably Return to It

PREDICTION that Cleveland, having once tasted the benefits of efficient government, would never again be satisfied with "political city government" and would shortly return to the City Manager Plan, was made by William R. Hopkins, former City Manager of Cleveland, in an address at the National Conference on Government, in Buffalo, on November 9.

Cleveland's vote on November 3 to abandon the city manager plan, after ten years of operation under it, was a chief topic of interest at this joint meeting of the American Legislators' Association, Governmental Research Association, National Association of Civic Secretaries, National Municipal League and Proportional Representation League.

In his address Mr. Hopkins expressed his belief that, following the inefficient administration which had resulted in the adoption of the city manager charter in 1921, "no large city in the United States made a record comparable to that of the city of Cleveland during the years 1924 to 1930." And the former City Manager added the further vigorous declarations:

"Certainly no such record was ever made before in the city of Cleveland itself. And certainly the voters of the city never got so much return from any action taken by them as they did from their action in adopting the city manager plan.

"But while these results were being obtained in administration, the city manager plan, by reason of these accomplishments, was accumulating a steadily increasing list of opponents. The economies in administration which were effected by securing more efficient service from each employee necessarily reduced the number of employees on the payroll. It was impossible to reduce the cost of city government without reducing the number of city jobs. Likewise, it was impossible to save money on city purchases without destroying political patronage, and it was impossible to put city contracts on a strictly business basis without destroying more political patronage. The administration was going in a direction exactly opposite from the direction which the Council and the political authorities would have chosen. In like manner, vigorous defense of the city's rights in important negotiations with outside powerful interests created powerful political antagonisms. There are still many powerful interests which do not expect from a city employee the same zeal which they expect from their own employees in carrying a plan to completion. These people resent efficient city administration because it deprives them of advantages which they have become accustomed to expect in dealing with city government.

"The year 1928, the fifth year of the city manager form of government, brought all of these forms of opposition to a definite head.

"In the third charter campaign in 1929, all of these disgruntled forces combined with the people who never believed in the theory of the manager plan but honestly believed that the chief executive of the city should be elected. In that situation, the people interested in good government presented a front so strong as to defeat the third charter amendment. In the succeeding election of the City Council a majority of the members elected were pledged to honest support of the city manager plan, but after the election enough of these members broke their pledges to enable the Republican boss to take a majority of the members into a caucus where it was determined to oust the City Manager and install in the office a man selected by the Republican caucus to be the Republican City Manager. In the light of this complete betrayal of the supporters of the manager plan by members of the City Council who had been elected under pledges to support that plan, ... It was not strange that many ardent believers in the city manager plan were so outraged by this violation of it as to take the first opportunity to vote out the plan itself. . . .

"By the time the people were called upon to vote again on the retention of the plan, it was perfectly evident to every one that since Cleveland was controlled by a boss who was able to name and dominate the City Manager and name and dominate the City Council, the city manager plan actually facilitated his operations. Neither the city manager nor any other plan can be a success while it is entirely operated by people who have no belief in it and whose efforts are largely directed toward subverting and defeating actual operation of that plan.

"In the election on November 3, about 6,000 people who had formerly supported the plan changed front and opposed it, giving the new charter a majority of about 9,000 instead of a majority of 3,000 against it as in 1929. The city of Cleveland now faces the prospect of a non-partisan primary election on January 10, in which the two men receiving the highest number of votes will proceed to stand for election on

February 12, and although the whole fight for the new charter was based on the theory that there should be a party candidate and party responsibility. The structure of the charter itself leaves no room for partisanship, forbids the intervention of party or party considerations, and officials undertaking to act as partisans will be obliged to do so in violation of the charter itself.

Three Definite Conclusions

"The net result of my experience with, and observation of, the government of Cleveland may be stated in three very definite conclusions:

"The first is that no city will ever be able to have a good government as long as the City Council or legislative body is held in low esteem and the office of member of the City Council is regarded as the lowest of all elective offices.

"The second conclusion which I reached was that the root of all of our evils in city government is the idea that it is somehow permissible or inevitable that certain men, certain organizations, should make a private business of influencing the action of city government for their own financial advantage.

"The third conclusion which I reached was that any permanent improvement of city government must begin with improvement of the quality of the City Council and that this is the point at which the greatest results can be accomplished in the most natural way and with least expenditure of effort and money.

What About the Future?

"Cleveland will never again be long satisfied with political city government. The more the new Mayor tries to go back to the old ways and revive the old practices, the sooner the people will decide to be rid of him and them. The city manager plan is not perfect, but it is headed in the right direction. It is so much better than any which preceded it, that a community which has seen it work and enjoyed its benefits will certainly go back to it.

"American cities can never hope for good government until they have taken administration out of politics. Thus far government of great cities in America has been different from that of great cities in all other progressive countries in two respects: the first is, the election of chief executives by popular vote; the second, the amazing inefficiency running always toward corruption. The first explains the second. When we abandon the folly of awarding executive and administrative power to those most gifted in the arts and wiles and corruption of local politics, when we recognize the administration of a great city as a most serious and difficult business and have sense enough to put it into the hands of people qualified to handle it, we shall make a real beginning of city government.

"Not until we do this, will the administration of our great cities cease to be a shabby, disgraceful thing, a menace to the health and safety and morale of our people and a perilous weakness in our whole structure of government."

Working the Unemployed without Proper Tools Is Wasteful and Shortsighted

PROHIBITING the use of proper tools in order to make work for the unemployed has been definitely scored as a delusion, as pointed out in the November issue of *Parks and Recreation*. Park superintendents are well aware of this, for it is to park departments that relief committees first turn when a city survey in the interest of the unemployed seeks to locate tasks for which a minimum of equipment and materials and a maximum of labor will be required. It takes time to acquire land and prepare plans for such work as buildings and roads, so the park department comes to the immediate rescue.

In some cases the funds appropriated for relief work are subject to the restriction that little or no expenditure be made for tools and equipment. Such handicaps to economy and good workmanship are vigorously opposed by the competent and farsighted executive, who will continue to insist that work under his direction shall be efficiently executed and shall show results that justify reasonable expenditure. He will also insist that it is never good policy to do a poor job because proper tools were prohibited.

The unemployed come from all walks of life, with diversified occupations. The majority are wholly inexperienced in park work and it is not practical to employ them on park lands that have already been developed. The park executive and superintendent must therefore direct his effort towards setting these men at work in undeveloped park areas.

The common-sense procedure is to extend such areas by clearing wooded sections of dangerous, dead and lying trees and stumps, brush and débris before starting the construction of paths, roads, or major developments. A large number of the unemployed are put at work digging out trees and stumps. On jobs where proper tools are prohibited it has often been observed that five or six men will be digging and cutting around one stump for the best part of a week. The waste of such an operation is comparable to the carrying of a steel beam by hand to the tenth floor because there is no derrick on the job. Laborers should no more be expected to do such work without proper tools than they should be required to move dirt with their hands or transport it in baskets instead of trucks. The right equipment would have removed the stump in a few minutes, leaving work which these men could properly do—digging the earth off the roots, backfilling the holes, piling and burning the stumps, and cording wood for distribution as fuel.

Ninety per cent of the cost of hand methods on such work is wasted, which might be used for the productive task of clearing more area. Worse yet, most of the roots are chopped and remain in the ground, to interfere with future planting and to produce, through disintegration, the disastrous results of fungi and winter kill, known to every park man. Reputable manufacturers will cooperate to supply efficient clearing equipment on the basis of assisting unemployment relief rather than of profit.

The shortsighted policy of prohibiting adequate equipment on road and street work should also be consistently opposed. Continuous and progressive effort has been made to increase the life of paving by approved specifications for mixing, tamping and surfacing. The hand-rolling of subgrade and the incorrect mixing of concrete mean the abandonment of good practice and can only result in settlement, cracking, excessive wear, and heavy replacement or maintenance expense.

Many city park departments have now the opportunity to expand and beautify at very reasonable cost if suitable and efficient methods and equipment are used with the available labor. Equipment does not deprive men of jobs. There is plenty of work for labor under efficient conditions.

When taxpayers observe wasteful procedure of public work owing to lack of tools and other equipment, they have a real right to complain that their officials are lacking in experience or ingenuity. Executives will do well to maintain their reputation for efficiency by a united stand that the need to employ men does not imply a need to employ them wastefully.

Records and Administrative Methods of the Public Works Department of Troy, N. Y.

DURING the last half of 1931, the city of Troy has installed in its Public Works Department a system of records and administrative methods which places it among the pioneers in American municipal government. Not only do these new methods make it possible to furnish to Troy taxpayers a more efficient administration, but the installation is proving a model for other cities throughout the country.

This accounting installation was made without cost to the city. Troy was selected by the Committee on Uniform Street Sanitation Records as one of five cities for demonstrating how the Committee's proposals would work in actual practice. It proved an ideal city for such a demonstration because of its location, size, topography, and public works organization, and because it is conducting all the activities covered by the Committee.

As in private business, the management of such a big organization as a municipality requires high engineering and executive ability; moreover, public works officials need to receive a stream of facts about the work and cost of their departments. They should know how much work is being produced, the quality of the work, the cost per unit of work, and whether the work accomplished conforms to the work planned. Daily, monthly and annual reports must supply a complete picture of public works operations, and must be so analyzed as to point out where changes are needed. Every phase of the work and its cost must be controlled so that waste may be avoided and good service furnished to all. In turn, the public works officials must satisfy the inhabitants with the following services: construction, maintenance, and cleaning of streets and alleys; removal and disposal of garbage, ashes and other refuse; sewer construction, maintenance and cleaning; catch-basin repairs and cleaning; construction and upkeep of all public buildings; supervision and maintenance of the city park system; direction of city recreational activities; elimination of grade crossings; inspection of buildings to assure conformance with building codes; and execution of all contracts for public improvements. These services for the 73,000 inhabitants of Troy require approximately 350 men and 50 pieces of rolling equipment and represent an annual expenditure of nearly one-half million dollars.

Check Against the Over-Expenditure of City Funds

Each year the Common Council of Troy appropriates nearly one-half million dollars for public works services. The Mayor and Director of Public Works thereby face the delicate task of coming out even at the end of the year and still supplying all the services anticipated. This task is made more difficult by the fact that some services are seasonal, such as snow removal, street cleaning, and street repair work.

As a means of knowing just how expenditures compare with appropriations, Troy officials have for some years prepared a statement at the end of each month which gives this information. This statement is strongly endorsed by the Committee on Uniform Street Sanitation Records and is continued in a slightly modified form. A copy of this is reproduced. It shows for each activity of the Public Works Department the total appropriation, the payments for the month, the payments for the year to date, orders outstanding, and the unencumbered or available balance.

Control over Work Performed

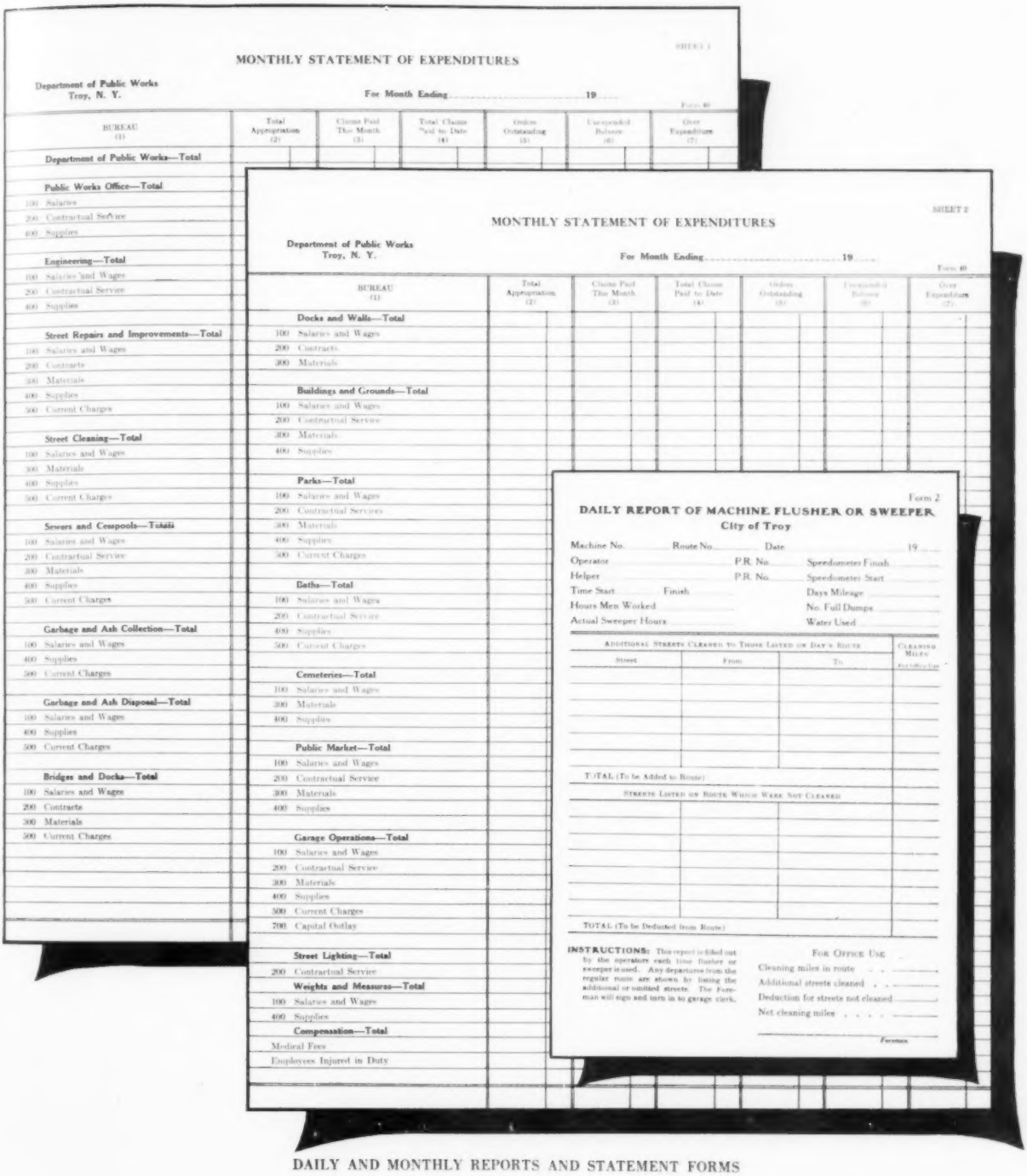
A complete record is now kept in Troy of the accomplishments of each employee and each piece of equipment. Not only does this make it possible to equalize work, but good workmen may receive due recognition. These records of work done also aid the Public Works officials in planning their work systematically and in distributing effectively the 350 men and 50 pieces of motor equipment. For example, armed with such knowledge, garbage-collection routes and street-cleaning routes can be laid out scientifically rather than by guess. Form 2, which is reproduced, is a copy of a report submitted daily by all machine flusher and sweeper operators.

These same records also aid in accounting for the time worked by each employee and in preparing the payroll. The number of hours on each job must check with the total number of hours on the payroll. If the installation is carefully followed, there will be no opportunity for erroneous payments.

Motor Equipment Receives Careful Analysis

Each year the city of Troy spends large sums of money in operating trucks, tractors, street-cleaning machines, snow loaders, and other equipment. Since most of this equipment must work out of the sight of city officials for long periods of time. it is quite necessary that daily reports be submitted by the drivers telling what the equipment did, how long it worked on each job, the number of loads hauled, and other important parts. This is covered by Form 2.

When the figures from these daily reports of equipment are added to the garage records of repairs, depreciation, and overhead, a complete story is at hand on the cost of its operation. This story is kept on a separate record for each piece of equipment. It tells at the end of each month how much the truck, tractor, or any other piece of equipment cost to operate per mile and per hour, the miles obtained per gallon of gasoline or oil, and the amounts of work done. With such facts at hand, Troy officials are in a position to distribute the equipment so as to get the most work for the least cost. Otherwise great losses may occur from idle time or the use of an incorrect type of equipment.



DAILY AND MONTHLY REPORTS AND STATEMENT FORMS

Similarly, there comes a time in the life of each piece of equipment when the costs of repairs and fuel are so high that it is not economical to operate it any longer. The analyses made possible by this installation of records will tell almost to a day when it will be cheaper to purchase a new machine and discard the old one.

Proper Use of Materials and Supplies Assured

If the purchase and dispensing of gasoline, oil, and other supplies and materials is not adequately controlled, there is no way of knowing whether a proper and economical use is made of them. Troy has controlled effectively the issuing of gasoline and oil to equipment at the city garage. This control has now been extended by means of a perpetual inventory to cover materials and supplies at the garage as well as small tools stored at the City Hall. Form 15, which is reproduced, is an inventory card for this purpose. With the addition of requisition, purchase order, and Street Materials Used forms, the records control over materials and supplies is complete and carries all necessary information.

An important test of management in any business is its ability to plan and forecast work and to operate in con-

A LOOSE-LEAF INVENTORY CARD FOR MATERIALS, SUPPLIES AND SMALL TOOLS

formance with such plans. The installation in the Public Works Department at Troy recognizes this test and has made the use of a work program one of its most important features, corresponding to the production or operation programs used by industries. It shows the amount of work to be done during each month of the year, such as miles of streets to clean; how it is done, whether by hand or machine; the unit cost which may serve as a standard to be attained; and the total cost of the particular operation during the year.

At the end of each month a detailed statement prepared in the Public Works offices informs the officials whether they have conformed to the program and to the standards set forth in it. A statement may show, for instance, that it cost $1.10 to collect a cubic yard of garbage, whereas the work program sets forth $1.00 as a standard amount for this work. This would be the signal for the officials to analyze the work in all its details to find the remedy. As an aid to finding the remedy, the complete records provided will prove invaluable.

The International World Police

A PROPOSAL has been made by Barron Collier, Special Deputy Police Commissioner of New York City in charge of foreign police relations, for the organization of an International World Police, its members made up of responsible police executives of every major municipality in all the countries of the world. Already the plan has been approved in general by the three leading police organizations of the world—the International Police Conference, the International Criminal Police Commission, and the International Association of Chiefs of Police, which through resolutions adopted by the first two at their September conference in Paris, and by the last at its October conference in St. Petersburg, Fla., have laid the groundwork for the necessary organization. The next step will be that of working up the details of operation of the International World Police, and the selection of a headquarters which will be, in effect, a clearing-house of international criminal information.

The objective of the International World Police will be the handling of international police problems exclusively. These problems in particular apply to immediate identification of criminals; their detention and prompt return to proper jurisdiction for trial; the eradication of the white-slave traffic, drug traffic, etc., further perfection of modern-day methods of police communication, and, above all, the efficient and friendly cooperation of the police officials of the various nations, among themselves and among their governments.

In presenting his proposal for an International World Police to the three police organizations named, Commissioner Collier nominated H. E. Johann Schober, Vice-Chancellor of Austria and newly re-elected President of the International Criminal Police Commission, as President. With Vice-Chancellor Schober, Commissioner Edward P. Mulrooney of the New York Police Department, Hon. M. Louis Ducloux, Controleur General de Recherches Judiciaries, Ministry of Interior, Paris, France; the Hon. Florent Louwage, Commissioner and Chief of the Police Judiciary Delegations, of Belgium; Dr. Antonio Pizzuto, Sureté Publique, Rome, Italy; Dr. Hans Menzel, Director of Police and General Administration, Ministry of the Interior, Berlin, Germany; Hon. Cesar E. Etcheverry, Police Delegate to the Argentine Embassy, Paris, France; Dr. Van Houten, Major de la Maréchaussée Royale, Holland, and other prominent police executives, the International World Police will be organized and in operation in the near future.

"This new organization," says Commissioner Collier, "is not intended to supplant any of the established police organizations existing today. It will operate solely as a clearing-house of all police organizations and will be entirely international in its scope. It will speed up international police relations to the extent that it will effectively block the door through which international criminals, with the aid of modern transportation, at present operate."

Codify Your Local Ordinances

"IT is probably true that 85 per cent of the municipalities of the United States under 30,000 population have no systematic, up-to-date statement of the local laws under which they live."

This arresting statement is made in Public Affairs Bulletin No. 3 issued by the Bureau for Government Research of West Virginia University, in Morgantown; John F. Sly, Director of the Bureau. The importance to a community of knowing clearly and accurately where it stands under the law is evident from the following:

"Laws, like bicycles, motors and top coats, become outworn and they must be either discarded, remodeled or ignored.

"It is against the principles of good government to allow local ordinances to become obsolete or to be continually violated, with spasmodic efforts to enforce them.

"The extreme uncertainty of officials themselves as to what the law is, and particularly their own authority under it, leads to indecision and loss of community effectiveness.

"Law that is not available is not usable—this requires 'a compact code, published in permanent form, kept up to date and indexed for accurate use.'

"To be valid, local ordinances must coincide with constitutional amendments, legislative changes and judicial decisions, —this means a painstaking knowledge of current legal developments."

Codification, says Dr. Sly, requires a large degree of facility, training and care. It must (1) provide a careful grouping of related subject matter; (2) allow insertion of new ordinances under their proper headings without undue complications in the numbering system; and (3) permit the city clerk or recorder to keep an orderly record of additions and amendments. The Bureau has prepared a chapter heading for a model administrative code to fit West Virginia municipalities under 2,000 population. The provisions are arranged as follows:

CHAPTER III—ADMINISTRATION

Article 1. Officers and Duties: General
Article 2. Mayor
Article 3. Recorder
Article 4. Sergeant
Article 5. Salaries and Fees
Article 6. Officers: Neglect of Duty

ARTICLE 1. *Officers and Duties: General*

3-101 Appointments
3-102 Powers and Duties: General
3-103 Same: To Enforce Criminal Laws of the State
3-104 Qualifications: Appointive Officers
3-105 Same: Elective Officers
3-106 Terms of Office
3-107 Tenure of Office
3-108 Vacancies
3-109 Oath of Office
3-110 Same: To Be Recorded

ARTICLE 2. *Mayor*

3-201 Mayor: Executive Duties
3-202 Same: Judicial Duties
3-203 Same: Police Duties
3-204 Same: Enforcement of Executions

ARTICLE 3. *Recorder*

3-301 Recorder: As Acting Mayor
3-302 Same: Custodian of Records
3-303 Same: Custodian of Municipal Code
3-304 Same: Inspection of Records
3-305 Same: Tax Bills
3-306 Same: Collections
3-307 Same: Accounts
3-308 Same: Bond

ARTICLE 4. *Sergeant*

3-401 Sergeant: As Treasurer
3-402 Same: Custody of Funds
3-403 Same: Disbursements
3-404 Same: Police
3-405 Same: Dog List
3-406 Same: Bond
3-407 Same: Recovery

ARTICLE 5. *Salaries and Fees*

3-501 Salaries and Fees: General
3-502 Councilmen
3-503 Mayor
3-504 Recorder
3-505 Sergeant
3-506 Witnesses
3-507 Salaries: How Paid
3-508 Fees: How Paid

ARTICLE 6. *Officers: Neglect of Duty*

3-601 Officers: Neglect of Duty; Penalty

A code is useless without an analytic index to the general items of the contents, as well as a detailed cross-index to specific minor provisions; and this index must meet not only the needs of the legal profession but also those of any intelligent person unfamiliar with legal methods. Obviously, the revised local ordinances must be in accordance with every provision of the state constitution, code and sessions laws, and must themselves be within proper legal bounds; otherwise, under them there is no protection from the courts.

"For instance, a few years ago Charleston established a building line on certain streets to prevent the encroachment of abutting property owners, and while the city charter quite clearly gave the council such authority, the Court decided that because it was done for a purely 'esthetic consideration' with no 'reasonable reference to the safety, health, morals and general welfare of the people at large, it was invalid and therefore unenforceable as a police regulation.'"

A City Buys Its Own Bonds

TO THE EDITOR OF THE AMERICAN CITY:

The city of East Cleveland is in the market for its own bonds. While many cities are having serious difficulties in meeting their bond and interest sinking-fund requirements, East Cleveland is in the fortunate position of having a considerable surplus of funds and is taking advantage of the bond market in purchasing back its own bonds at a price considerably lower than what they originally sold for. Inquiries should be addressed to Charles A. Carran, City Manager.

The following list has already been purchased:

$8,000—5% saving bonds
15,000—4½% saving bonds
28,000—4½% street opening bonds
11,000—4¾% street light equipment bonds

East Cleveland has operated under the city manager form of government for the past fourteen years and during the depression immediately following the war and during the present depression has been in a very strong financial position, never having had to curtail service or issue refunding bonds or notes for sinking-funds or operating purposes. It has enjoyed a very low rate for municipal operating and sinking-fund purposes, which at the present time is $6.95 per $1,000 tax duplicate valuation.

CHAS. A. CARRAN,
City Manager.

The City Planning Clinic—A New Service

CONVINCED that in spite of the hundreds of planning agencies and zoning boards active in every part of the country there is still little general appreciation of the meaning and value of city planning, and little support of planning programs by the public and by political and business leaders, the National Conference on City Planning and the Planning Foundation of America are announcing a new service to cities to conduct planning clinics. The object of these will be to present to the political, business and social leaders of the city the idea of city planning, the values of a planning program at all times and its particular value in times of unemployment, and a scheme for public support.

Flavel Shurtleff, Secretary of the Conference, will assist in the organization and will lead the clinics. He will also be available for planning talks before civic groups and for conferences on questions of organization. For one-day clinics a charge of $50 will be made, and for a two-day clinic, $75, plus actual railroad fare both ways. For a city in the 50,000 to 100,000 population group it is believed that two days and at least four clinics will be necessary. For further information, address the Conference, 130 East 22nd Street, New York.

Sewer Construction Affords Unemployment Solution

By JOHN T. HOPKINS
Town Engineer, Westfield, N. J.

Low Costs Maintained by Using Inexperienced Unemployed Labor and Concrete Pipe of Local Manufacture

THE CONCRETE PLANT
Where the pipe was made by local labor

THE town of Westfield, N. J., in common with most other municipalities, has been trying to solve the problem of how best to relieve the unemployed in the town, and has decided that the construction of necessary or desirable municipal improvements is the proper way for the taxpayers to get the most for their unemployment relief money. In order to insure that the work shall be accomplished at practically no more expense than would be the case if the relief of unemployed were not of importance, due consideration had to be given, by those in charge, to the type of work the unemployed in the town could do most advantageously.

Among the more important improvements needed by Westfield was the construction of a trunk sewer from the present sewage treatment plant to the recently constructed Rahway Valley trunk sewer. The Town Council decided to require that the concrete pipe for this trunk sewer should be constructed within the limits of the town of Westfield, using the local unemployed labor, and that the contractor who laid the sewer must also employ local labor. The deci ion regarding the pipe was first made for this job, but the requirement as to the use of local labor on sewer work had been tried out very successfully on a previous job.

The bids on the sewer work and the pipe prices showed no increase because of the requirement for using local labor, so the town is being spared the expense of supporting a very considerable number of unemployed for several months without any addition to the cost of the public improvement, and both the sewer and pipe contractors are finding that with careful supervision they are getting their work done with local labor at the same unit costs that they would expect if using only experienced men.

Another advantage, from the point of view of the Town Engineering Department, is that the sewer pipe are made under its direct supervision with less expense for inspection than would be the case with pipe made at some distant point and trucked or shipped in.

LAYING THE PIPE

"The Rahway Avenue Sanitary Trunk Sewer" is the name of the contract mentioned above; Jacob Jacques, of Irvington, N. J., is the sewer contractor; and the Newark Concrete Pipe Co., of Newark, N. J., are the pipe manufacturers. The pipe plant is set up right on Rahway Avenue adjacent to the job.

UNPLANNED COUNTY HIGHWAYS AND UNEMPLOYED ENGINEERS

POINTING out that the unemployment problem affects not only the laboring man but also the professional man, such as the civil engineer, Major George W. Farny, of Morris Plains, N. J., Chairman of the National County Roads Planning Commission, urges special consideration by county and municipal officials to highway planning during the coming winter.

The preparation of comprehensive plans for future highway development, as Major Farny states, would serve a two-fold purpose: (1) counties and municipalities would profit by the carrying-out of well-thought-out plans through future years; and (2) work for civil engineers would be found.

The National County Roads Planning Commission is engaged at the present time in the preparation of a Planning Manual, to contain an outline of successive steps which should be taken in analyzing and planning for a complete system of county highways. This Manual will be available for distribution at an early date and is offered to county commissions about to engage in county highway planning, as an aid to efficiency and economy.

Traffic Regulation Through the Centuries

Report of the Committee on Evolution of the Art of Traffic Control to the 1931 Convention of the Institute of Traffic Engineers

TRAFFIC regulation and control date back to the beginning of public interest in roads. The greater the utility of public roads and streets, the more imperative has been the regulation of their use.

After Rome had made some progress with the building of its system of roads over the Empire of which it was the capital, traffic congestion became a serious problem in that city. The famous Appian Way was started in 312 B. C. The Flaminian Way was begun in 220 B. C. Finally, at the height of its glory, Rome had 29 roads radiating from it as a center of a system of highways totaling 50,000 miles.

When, in the days of Julius Caesar, the parking of chariots and other vehicles caused congestion on the streets and tended to injure business, a regulation was established forbidding vehicles to enter Rome during business hours. Similar regulations were enacted in other large cities in the Empire, where this system of highways brought traffic congestion, according to the *National Safety News* for October, 1930. Roman legislation regarding highways is said to be the basis for much of our present road laws.

When, with the fall of the Roman Empire, the system of roads began to decay and finally ceased to exist, the history of traffic regulation and control shifted to other centers. The French and English began to build roads extensively. These nations became largely the centers of development and improvement in road transportation, and the origin of some of our best-known traffic laws and customs can be traced to these national sources.

Safety on the Streets

Public safety and public convenience have long dictated the policy of traffic regulation and control as well as the regulation of conditions adjacent to the roadway. Back in 1285, according to an article in THE AMERICAN CITY for March, 1926, a law was passed in England providing that "all trees and shrubs must be cut down for a distance of 200 feet on either side of the roads between market towns to prevent the concealment of robbers."

Public safety on the streets early began to be a problem in this country. A restriction against reckless driving was passed by the colony of Rhode Island in 1678 as the result of an accident in which a child was run down in the streets of Newport. The resolution of the Assembly provided that:

"Whereas there was very lately in the Towne of Newport on Rhode Island very great hurte done to a small childe by reason of exceeding fast and hard riding of horses in said towne, this Assembly, taking the matter into serious consideration and being desirous for the future to prevent the like mischief, doe ordain, etc.————that from and after the publication hereof, if any person or persons shall presume to ride on either horse, mare, or gelding, at a gallop or to run speedily—in the streets of Newport—said person shall for his offense pay into the treasury of said towne 5 shillings in money on demand; 2 shillings of which shall be paid to any person or persons that shall give information thereof, and the other 3 shillings to remain for the use of said towne."

In Boston in 1757 the Board of Selectmen passed an ordinance against fast driving, for protection of the public against accidents and general disturbance, according to the *Detroit Motor News* for May, 1924. The ordinance read that:

"Owing to great danger arising oftimes from coaches, sleighs, chairs, and other carriages, on the Lord's days, as people are going to or coming from the several churches in this town, being driven with great rapidity, and the public worship being oftentimes much disturbed by such carriages, it is therefore voted and ordered that no coach, sleigh, chair, chaise, or other carriage shall at such times be driven at a greater rate than a foot pace, on penalty to the master of the slave or servant so driving of the sum of 10 shillings."

The General Turnpike Acts passed in England in 1822 and 1823 dealt in part with the rules of the road. In a single sentence this Act covered a wide variety of rules that we have expanded into several articles and sections in most traffic laws to meet our more complex traffic conditions. The Act imposed a penalty on every person who,

"Having the care of any wagon, cart, or carriage rides on the shaft, or without having rein and holding the same rides upon such wagon, etc., or on any animal drawing the same or is at such distance as not to have any control over every animal drawing the same, or who does not in meeting any other carriage keep his wagon, etc., to the left or near side, or who in passing any other carriage does not keep his wagon, etc., on the right or off-side (except in cases of actual necessity or some sufficient reason for deviation), or who by obstructing the street wilfully prevents any person or carriage from passing him or any wagon, etc., under his care; or rides or drives furiously any horse or carriage or drives furiously any cattle."

A famous court ruling regarding the parking of vehicles that is recognized in American courts today had an early English origin. It is said that during the reign of Henry VIII in England an innkeeper was brought before a magistrate for storing his vehicles and those of his guests on the road in front of his inn. The case was finally brought before the House of Lords, which body held that "an innkeeper must not make a stable of the King's highway." But it was Lord Chief Justice Ellenborough who restated this principle in 1812 in the language that is now familiar. He ruled that:

"Every unauthorized obstruction of a highway to the annoyance of the King's subjects is a nuisance. The King's highway is not to be used as a stable yard."

Protection of Road Surfaces

The need for protecting the public road surface was recognized as a problem in the General Turnpike Acts, by establishing load limits. Wagons with 9-inch tires were restricted to a gross load of 14,400 pounds, or 400 pounds per inch width of tire. For 6-inch tires this maximum

load was increased to 436 pounds per inch width. Two-wheel carts were allowed even a higher load, 450 to 500 pounds per inch of tire width. All of these limits were for wagons and trucks without springs. The value of springs in reducing the impact of moving loads upon the roadway surface was recognized by allowing an additional load of 9,460 pounds on vehicles on which springs were provided. In the same Act the need for greater protection of roads during the winter months was recognized by reducing the maximum allowable load from 6 to 16 per cent between November 1 and April 30. It is said that this preceded similar legislation in America by about 90 years.

Early in the nineteenth century the self-propulsion of vehicles began to be the subject of experiment and invention. Immediately Parliament received many appeals for protection against these devices, some to insure greater safety in the use of the highway by other traffic, and some to protect the interests of other competitive passenger carriers. The resulting legislation pertained largely to public protection, but, without waiting for legal means, the competitors devised ways of their own for harassing the new method of transportation.

Stage-coach operators who had leased the roads at the time feared the new competition, and farmers foresaw a decline in the price of their horses. As a result, toll-gate keepers were allowed to exact high fees from these steam-propelled vehicles. Sometimes the competitors dug trenches across the highways to wreck them.

The Growth of Regulation

The *Chicago Daily News* of January 28, 1931, says that Parliament in 1863 imposed a high tax on self-propelled vehicles. The owner and operator were required to have a man walking in front of each vehicle with a red flag to warn pedestrians of its approach. A Locomotive Act that was passed in 1861 required three things, none of them dissimilar to regulations or practices that have been common in this country in more recent years:

"The drivers of locomotives must give as much space as possible for the passing of other traffic.

"Every locomotive must be instantly stopped by the person preceding the same, or any other person with a horse or carriage drawn by a horse, putting up his hand as a signal to require the locomotive to be stopped.

"Any person in charge of a locomotive must provide two efficient lights to be affixed conspicuously, one at each side in front of the locomotive."

This development of the self-propulsion of free-wheel vehicles was eventually to bring new problems. The first recorded quantity production of motor vehicles in the United States was in 1869, when four were manufactured. Since that time more than 48,000,000 have been made and nearly 27,000,000 of these are still in use upon the streets and highways. With this rapid development, traffic control at street intersections became necessary. This was done first by officers and then by various types of devices, some operated by officers and others substituting for them. Signs came into common use. These problems have been of such recent development that the Committee has not considered it necessary to make a detailed study of the various changes that have taken place and the improvements that have been made.

According to William Phelps Eno, there were few rules for driving in effect in American cities prior to 1903. Traffic had practically to handle itself. An effort was made in New York City on October 30, 1903, as police regulations rather than as an ordinance.

Since that time the problem of regulation has grown so rapidly that practically every city of any appreciable size has adopted regulations, either by police order or as an ordinance. But there has been great variety in these regulations, as well as in the signals, signs, markings, and practices in traffic administration. It became evident that uniformity of practices was necessary.

Various efforts of standardization culminated in the three National Conferences on Street and Highway Safety held in 1924, 1926 and 1930 called by the Secretary of Commerce. Directly from these Conferences and through the activities of contributing and associated organizations, standards for uniformity were promulgated for both legislation and equipment. In addition, recommendations for the greater employment of engineering methods in traffic administration were made, with recommendations to aid engineers in discharging their new responsibility.

The growth of the number of traffic engineers employed by city and state departments and unofficial organizations created a demand for a professional association of traffic engineers. Hence, supplementing the activities of various organizations, particularly associations that were promoting better and more uniform methods of traffic handling, the Institute of Traffic Engineers was organized at the time of the Nineteenth Annual Safety Congress, in Pittsburgh, October 2, 1930.

Rapid municipal growth, supplemented by enormous commercial and industrial development, and the introduction of the new type of highway transportation, the motor vehicle, have recently brought to a focus the scattered efforts of centuries for traffic regulation and control. Your Committee recommends that, with the rapid improvement that is certain to come within the next few years, the Institute of Traffic Engineers should maintain a continuous record of the developments and resume, from time to time, the research into the history of the development of traffic regulation and control as new developments make past events significant.

COMMITTEE ON THE EVOLUTION OF TRAFFIC CONTROL
Earl J. Reeder, Chairman
Reyburn P. Hoffman
K. W. Mackall
Joseph G. Regan

U. S. Bureau of Public Roads to Conduct Traffic Research and Experimentation

AT the Third National Conference on Street and Highway Safety, held in Washington last year, a resolution was adopted requesting the cooperation of the Federal Government through research and experimentation upon important phases of various problems connected with traffic congestion and safety on the streets and highways. Word has now been received that, after approval by President Hoover, the Secretary of Agriculture has authorized the Bureau of Public Roads to undertake this work.

It is understood that suggestions as to desirable subjects to be included in these new activities of the Bureau of Public Roads will be welcome if addressed either to Thomas H. MacDonald, Chief of the Bureau, at the Department of Agriculture, or to A. W. Koehler, Secretary of the National Conference on Street and Highway Safety, at the Department of Commerce.

TRAFFIC CONTROL AND FACILITATION

Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straets

Inter-City Public Safety Contest Announced

THE National Safety Council has just announced an inter-city safety contest covering the year 1932, with awards to be made in the spring of 1933. The cities have been divided into population groups of over 500,000, 250,000-500,000, 100,000-250,000, 50,000-100,000, 25,000-50,000 and under 25,000. At least one award will be given for each group, one for the best of all groups, and a special award for the state making the best aggregate showing.

The cities will be graded according to a schedule covering both the accident record and accomplishments along the following lines:

A. Accident Record—*50 points*

B. Accident Reporting—*5 points*
   (1) Use of Standard Traffic Accident Reporting System or equivalent, including monthly reports to the National Safety Council and proper filing of reports locally.

C. Traffic Engineering—*10 points*
   (1) Traffic engineering facilities—organization and methods (i.e., city traffic engineer, or traffic engineering work by city engineering department).
   (2) Traffic engineering survey by competent parties within past five years (or earlier, if kept up to date), including action in carrying out the recommendations.
   (3) Character of city's traffic engineering activities as revealed by questionnaire and exhibit.
   (4) Extent of conformance with standards of traffic control signals and signs.

D. Traffic Law Enforcement—*15 points*
   (1) Extent of conformance of the city's traffice ordinance with the Model Municipal Traffic Ordinance.
   (2) Proper organization of traffic forces in police department and extent of traffic activity.
   (3) Character and extent of accident investigation for conviction of violators.
   (4) Specialization of the hearing of traffic cases in court.
   (5) Type and extent of operation of traffic violations bureau or its equivalent.
   (6) Report on number of arrests and summonses and the number of convictions resulting, during the year.

E. Child Safety—*10 points*
   (1) Regular program of traffic safety instruction in elementary schools, including designation of safety supervisor and regular provision of safety material for all schools.
   (2) Regular program of traffic safety instruction and activity in high schools.
   (3) Standard junior safety councils or school boy patrols. Name individual supervising same.
   (4) Regular program of traffic safety activity on summer playgrounds.

   (In connection with each item state number of schools or playgrounds in the city and number engaging in each of these activities.)

F. Public Education—*10 points*
   (1) Newspaper publicity—number of column inches during the year on traffic accident prevention activity (not simply news stories of accidents). Present scrap book of publicity if possible.
   (2) Radio traffic safety program—describe.
   (3) Street traffic safety posters—number, location and when changed.
   (4) Special traffic safety campaigns during the year—brake or headlight testing, safety week, courtesy week, etc.
   (5) Commercial driver activities—fleet superintendents' organization, inter-fleet contest, etc.

G. Community Safety Organization—*10 points*
   (1) Community council or other community body carrying on a continuous, comprehensive traffic safety program. Present brief outline of activities, budget, list of working committees, number of meetings of such committees, number of other meetings conducted by such organization and other details to show an active program.

Procedure

Each city desiring to enter will do so by signing an entry blank, obtainable from the National Safety Council, 20 North Wacker Drive, Chicago, Ill., to be signed by the mayor or by a city official or a community organization on behalf of the mayor.

Entries should be received before January 1, 1932, but will be accepted up to February. Entries after February 1 will be by special arrangement, as in the case of a new administration or new community organization.

The city will submit in January or February, 1933, a report on all items in the above schedule. Such report need not be voluminous nor elaborate, but must simply show what the city has been doing along the various lines included in the schedule.

There will be no charge for participation in the contest, and the city will not incur any obligation other than the furnishing of reports as stated above.

Any city which claims to be making a serious attempt to reduce its accidents should certainly enter this contest. It should also give the cities a chance to see how they compare with one another and to exercise the American spirit of competition.

Philadelphia's New Traffic Control System for North Broad Street

A PROGRESSIVE traffic signal system of the most modern type has recently been installed on Broad Street, Philadelphia. The system comprises signals at 76 intersections interconnected with a master controller located at City Hall.

The master controller incorporates a "program clock" which regulates the timing of the entire group of signals, varying it at different periods of the day and different days of the week in accordance with a schedule based upon the observed traffic volumes and speeds. Traffic on Broad Street, as on most main arteries, is predominately inbound in the morning and outbound in the evening, with a heavy crosstown flow during the middle of the day. The program clock is so arranged that all ordinary changes in the timing of the signals to accommodate these regularly recurring variations in traffic conditions are automatically made without supervision at the central controller.

Special conditions which warrant individual treatment, such as stormy weather, parades, baseball games and other scheduled events drawing large crowds, are taken care of by the signal engineer at City Hall, who sets up a special program of timing. This program is automatically and accurately followed out by the program clock, which changes the signal timings at the exact time and in the exact manner determined by the engineers in advance. At the completion of these special periods, the regular signal timing again becomes operative automatically.

Should an accident damage the controls at City Hall, the system will continue to operate satisfactorily until repairs are made.

In case of fire, the Electric Bureau can interrupt the program and run the signals for the entire street or any one local intersection.

While the system is controlled from the City Hall, the control of any intersection can be taken over by a policeman without disturbing the rest of the system, and when he is through with his emergency control, the signals at the intersection will automatically go back into step with the whole system.

A Method of Making Short Traffic Counts and Estimating Traffic Circulation

A RESEARCH for making short traffic counts and estimating traffic circulation in urban areas was made at the University of Wisconsin in 1924 under the direction of the Barney Link Research Fellowship, which was established by the Outdoor Advertising Association to study problems in advertising, marketing, circulation and landscaping in connection with advertising. A preliminary report was issued in 1927 and the full report has just appeared.

For the purpose of developing factors, cities were divided into population groups of 500,000, 200,000, 100,000, 50,000 25,000, and less than 25,000 population.

Counts were made for 12- and 18-hour periods and were recorded by 15-minute intervals. Calculations based on half-hour counts were found to be as accurate as those based on full-hour counts, if the counts began on the quarter and three-quarter hour instead of the even hour or half hour. From these counts "characteristic" curves were made and the percentage of each half-hour period of the whole period obtained. The calculated figures for the actual number of cars

were computed by the following simple formula:

$$\frac{\text{Half-hour count}}{\text{Average per cent for that half-hour period from "characteristic" curve}} \times 100 = \text{Estimated daily circulation}$$

The morning off-peak period, 9:15 A.M. to 11:15 A.M., and the afternoon off-peak period, 1:45 P.M. to 3:45 P.M., showed the most even flow, and thus the best results were obtained by using two half-hour counts, 9:15 to 9:45 A.M. and 3:15 to 3:45 P.M.

The report then goes on to develop "constant multiplying factors" for the cities in the different population groups. On this basis, a half-hour count in the morning times the morning factor averaged with the afternoon half-hour count times the afternoon factor gives the estimated daily flow for 12 hours, 7 A.M. to 7 P.M. The study showed that the estimates were accurate to within 10 per cent, except for abnormal conditions such as fires, parades, etc.

A study was made of the relationship between 12- and 16-hour counts, which indicated that the 6-hour traffic from 6:00 A.M. to 7:00 A.M. and 7:00 P.M. to 12:00 P.M. was plus or minus 3 per cent of 30 per cent of the 18-hour period.

Similar factors were worked out for pedestrians, street cars and busses.

While some traffic engineers may not feel that this method is accurate enough for many traffic control purposes, it must be admitted that the principle suggested has many practical applications. Many more communities would probably take traffic counts if they were not appalled at the thought of having to take long counts. It would certainly appear that, if full counts were taken for any given area for certain years, sample counts based on the full counts might provide adequate accuracy.

Humanizing Traffic Laws in Connecticut

ACCORDING to Robbins B. Stoeckel, State Commissioner of Motor Vehicles, a plan to humanize existing motor vehicle laws will be presented to the General Assembly in 1933.

Simplification will be obtained through the use of the following five general headings: "The Individual"; "The Motor Vehicle and Its Equipment"; "Traffic"; "Departmental Functions and Relations to the Public"; and "Interlocking Activities" such as the licensing of gasoline stations, junk yards, and control of objects which might be considered traffic hazards.

Along this line traffic engineers and administrators should try to write rules and regulations in simple form for the benefit of the motorist. All details and legal language ordinarily included to insure conviction should either be left out or placed in a note added to the simple expression of the rule.

This is a field in which there remains a great deal of room for improvement.

Institute Committee Activities

REPORTS of four of the six committees of the Institute were presented at the recent annual meeting in Chicago. The Publications Committee, Maxwell Halsey, Chairman, and the Library Committee, William S. Canning, Chairman, editors respectively of TRAFFIC CONTROL AND FACILITATION and *Traffic Digest*, submitted, in lieu of a formal report, copies of their contributions to the literature of traffic engineering. Reports of the other four committees are briefed below, with the exception of the report of the Committee on the Evolution of the Art of Traffic Control and Regulation, Earl J. Reeder, Chairman, which appears elsewhere in this issue.

Committee on Professional Curriculum, Dr. Miller McClintock, Chairman

Traffic engineering, as a profession, has had a rapid growth and is now definitely an established branch of engineering. This growth will probably continue and there will be an increasing demand for men professionally trained in the field. It is recognized, however, that the demand will never reach a volume comparable with that in the standard branches of engineering. Traffic engineering is, and will continue to be, an engineering specialty.

The specialized character of the field makes it impossible to establish elaborate undergraduate courses in traffic engineering. On this account the Committee urges that traffic engineering courses be included in the highway engineering curricula of established schools of engineering, sufficient to acquaint the general student with the nature of the field and to provide the prospective traffic engineer with the necessary foundation for subsequent post-graduate specialization.

Committee on Terminology and Nomenclature, Guy Kelcey, Chairman

In the preliminary work of this committee, an attempt was made to define a number of words of first importance in traffic regulation and control. It was early found, however, that many of the expressions necessary to define properly such traffic terms themselves required definition in order that the term first to be defined could be properly treated.

Accordingly, the Committee is now endeavoring to assemble such definitions as are already well established by other branches of engineering and which have a bearing on the subjects under study. Considerable work has already been done along this line, and with the Committee augmented as proposed, the work can be materially speeded up and a tentative group of definitions prepared for the approval of the Institute at its next meeting.

Committee on Research, Major John P. Hallihan, Chairman

Although organized late in the year, the Committee reports considerable progress in the formulation of a program for traffic research, based upon the fundamental principles outlined in the resolution approved by the Third National Conference on Street and Highway Safety.

In addition to this activity, letters are being directed to all cities of 100,000 population and over to determine what, if any, research on traffic problems has been conducted by the municipality or by civic organizations. As copies of these surveys are received, they will be analyzed by a subcommittee to determine how the accumulated data can best be used as the basis for future research in some of the more important phases of the problem.

Committee on Traffic Signal Standardization

At the annual meeting, it was voted to organize a Committee on Traffic Signal Standardization, to be composed of traffic engineers and representatives of traffic signal manufacturers. The Committee is charged with a study of the possibilities of simplifying and standardizing traffic signal specifications in the interest of improved efficiency in operation and greater economy in purchase and maintenance. President E. P. Goodrich will act as Chairman of this committee.

Institute Members Elected

AT the recently held meeting of the Board of Direction in Chicago, the following applicants were elected to membership in the Institute of Traffic Engineers:

Clarence B. Bishop, Assistant Highway Transport Engineer, U. S. Bureau of Public Roads, Washington, D. C.

James R. Guthrie, Acting Assistant Engineer, City Planning Commission, Columbus, Ohio.

Loren W. McOmber, Engineer, Esso Manufacturing Co., Peoria, Ill.

Kenneth W. Mackall, Engineer, Crouse-Hinds Co., Syracuse, N. Y.

Reunah F. Randolph, Research Engineer, The United Railways and Electric Co., Baltimore, Md.

Report of the A. M. E. Traffic Control Committee

IN the report submitted October 20, 1931, by the Traffic Control Committee of the American Society of Municipal Engineers there is a summary of "Traffic Control Facts from American Cities of 100,000 Population or Over," as indicated by returns from a questionnaire. The principal conclusions to be drawn therefrom are:

1. The majority of American cities have not been "sold" on the desirability of creating official traffic councils and employing part- or full-time traffic engineers.

2. The majority of cities still operate their traffic signals with the amber light preceding the green, contrary to the recommendation of the National Council on Street and Highway Safety.

3. There is still some difference of opinion as to the advisability of right turns on red.

4. The flexible progressive method of signal operation, recommended by the National Safety Council, is favored by the majority of traffic officials as a primary system.

5. Only a limited number of cities have recognized the potency of roadway intersection expansion for increasing the traffic flow.

6. Mass transportation in cities is gradually being converted from street cars to busses.

European Traffic

A One-Way Street Ordinance in 1784

THE Duke of Sachsen-Weimar issued a special ducal decree in January, 1874, which introduced the then very novel procedure of restricting traffic to one direction in the street on which was located the Ducal Theater in Weimar, Germany. Traffic was to move in one direction before the performance, and the waiting carriages were to turn around and approach the theater in the opposite direction after the performance.

The Irish Free State Traffic Bill

THE Irish Free State has passed a traffic bill which in major points closely resembles the British Traffic Act. Nominal abolition of the speed limit is its most novel feature, but, quite characteristically upon conditions in the Irish Free State, a speed over 30 miles an hour will be regarded dangerous driving.

Compulsory liability insurance is imposed in respect to all motor vehicles, including motorcycles, and all fines will in future go to the Road Fund. A penalty for excessive noise will be imposed, including blowing of horns and backfiring. Drunken drivers and those under the influence of drugs will have their licenses suspended for one year at the first instance and for three years at the second offense. Bicycles and farm carts must have rear reflectors, and lamps will have to be carried in front of and behind flocks of sheep and droves of cattle on the road. Joy-riding is made an indictable offense. Busses accommodating fourteen or more passengers must have a conductor. Drivers of public conveyances must comply with rigid tests and will have to make a declaration of physical fitness. A six-day week is made obligatory for drivers of busses.

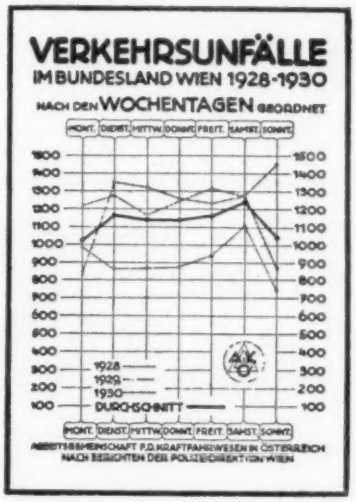
Interesting Accident Data from Austria

THE Austrian Motor Vehicle Association has compiled some very interesting accident data in trying to find the week, the day and the month during which accidents are heaviest. The district covered was the capital city, Vienna, and the charts above are based upon the accident reports of the Vienna Police Department. The research covered three years, 1928, 1929 and 1930.

The charts show considerable discrepancy in the various years as to the weekday on which most accidents happened. In 1928 and 1929 Saturday and Tuesday were the heaviest accident days, with Sunday representing the minimum. In 1930, on the other hand, Sunday represents the maximum.

This can be explained as a reflection upon the economic conditions prevailing in Austria. While in 1928 and 1929 the week-end movement started on Saturday, with a lull on Sunday and Monday, and a return to the city on Tuesday, in 1930, owing to bad economic conditions, motoring seemed to be confined to Sundays.

As to the most dangerous month, this again depends upon general weather conditions. Accordingly, May, June, September and October represent the heavy traffic months with a heavy toll of accidents.



ACCIDENTS IN VIENNA
as shown in statistics for days of the week, and for the different months over a three-year period

Accidents in Prague in 1930

PRAGUE, the capital city of Czecho-Slovakia, is a live city of 700,000 people. Despite the general bad conditions prevailing in Central Europe, Czecho-Slovakia has kept her industries busy. This is more or less evident in its automobile-per-population figure, which for Prague is much higher than, for instance, Vienna or Budapest. In 1930 there were 21,621 motor vehicles registered in Prague. The aggregate number of accidents was 9,730, almost every third auto being involved in an accident. In these accidents 3,666 persons were injured or killed. In regard to seriousness of accidents the figures are as follows:

Light injuries.....	2,841
Severe injuries.....	772
Fatal injuries.....	53

The calculated damage to the general public was 17 million crowns, or about $600,000.

It is quite interesting to note that despite the more rigid and generally uniform traffic laws and regulations, the accident ratio for registration is higher than that in the United States. No doubt, the rate per motor-mile is still higher. Whether this is due to a better cooperation in compiling accident statistics and a better system in compulsory reporting of them, or to a lack of driving skill, since the motor vehicle is comparatively novel to the general user, would be an interesting matter of research.

FORESIGHT NEEDED IN FINANCIAL AFFAIRS OF AMERICAN CITIES

IN concluding a study, just published, "The Present Financial Status of 135 Cities in the United States and Canada," based on replies to inquiries addressed by the Municipal Administration Service to finance officials or bureaus of governmental research in cities of over 30,000 population, Frederick L. Bird observes that "viewing the situation in its general aspects, it is fair to say that the majority of American cities are not thus far meeting the emergency in their financial affairs with a sufficient degree of foresight and good management.

"While the predicament of Chicago is far from being characteristic of any but a comparatively small number of city governments," he writes, "serious difficulties are in store for a number of cities which have been lax in their financial management in the past and slow to arouse themselves to the demands of the present crisis."

Mr. Bird finds that "American cities in general have not as yet resorted to salary and wage reductions as a means of reducing municipal expenditures. Whether recent wage cuts by large industrial concerns will influence a change in policy is not as yet apparent." His recommendations are that "if instead of indiscriminate cutting of salaries and ruthless slashing of department appropriations, city authorities will look beneath the surface to the need for fundamental reorganization of administration, elimination of wastes and the introduction of well-known, but too inadequately tried, efficient methods of carrying on public business, the current depression may prove in the long run to be a real boon to municipal government."

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

THE NEW NOBLESVILLE POOL
The illustration below gives an idea of its instant popularity

Noblesville in Providing Play Provides Work

NOBLESVILLE, IND.—Realizing the unemployment situation which confronted our community in common with the nation, members of the Noblesville Board of Park Commissioners met with the City Council last spring in a joint session at which they were authorized to proceed with a $15,000 swimming pool bond issue. The purpose was to aid able-bodied men at a time when they most needed work. Thus it was that ground was broken last spring for the project—and with its completion, during the summer, the entire community has acclaimed the result of this latest progressive move as Noblesville's greatest attraction.

In fact, outstanding recreation authorities term the pool the finest of its kind in the country in a community the size of Noblesville, whose population is given at 4,811. Speaking of Forest Park as a whole, of which the new pool is the latest unit, Charles Sallee, Superintendent of Parks, Indianapolis, Ind., said, "This park and its equipment are among the most complete I have ever seen."

The entire cost, including all materials, equipment, labor, and remodeling of the bathhouse, was $18,000. The bathhouse was formerly the office building of the Hamilton Chemical Co.

The ground on which the pool is built, comprising 30 acres, was given to the city of Noblesville by Mr. and Mrs. George A. Ball, of Muncie, Ind., members of a family noted for altruistic endeavors, who made possible Ball Teachers College of Muncie, a nationally known educational institution. The entire park consists of 150 acres.

Figures show that 11,288 labor hours were required, including both skilled and unskilled labor. The sum of $3,776.70 was expended for this item, representing an average wage of 34 cents per hour. Architectural and engineering services were obtained for the remarkably small sum of $500.

The dimensions of this 300,000-gallon pool are 80 x 175 feet. The water is changed in compliance with rules and regulations of the Indiana State Board of Health. The service capacity of the pool is 350 persons. Three thousand persons can be accommodated during a 24-hour period, according to Alden H. Baker, Park Board Secretary. The pool was designed and built to care for the normal needs of a community the size of Noblesville, J. S. Shannon, engineer and architect, stated recently.

Attesting the popularity of the pool during its first season in operation, beginning July 30, is the fact that 20,000 patrons passed through the turnstiles. All current expenses were paid and $2,500 turned into the City Treasury. Water sports and floodlighting equipment were provided by the Hill-Standard Co., the Graver filtration system was installed, and Wallace-Tiernan chlorinators were determined upon. The Continental Steel Corporation furnished the fence.

Members of the Park Board are: Kenneth Meara, President, Alden H. Baker, Secretary, Frank W. Tucker, Perry A. Bray and Harry L. Ingermann. Marvin E. Jessup is Superintendent of Parks.

KENNETH MEARA,
President of Park Board.

Marathon or Endurance Exhibitions Prohibited

CHICAGO, ILL.—It has become a fad on the part of amusement places in our cities to conduct marathon or endurance dances or exhibitions during the winter season. It was claimed in a Chicago City Council resolution that four of the dancers in an endurance contest were being cared for in a Chicago hospital as the result of physical exhaustion and heart strain. The Council, in accordance with a number of resolutions and proposed ordinances providing for the prohibition of marathon or endurance dancing contests, on July 30, 1931, passed an ordinance prohibiting such contests and fixing a fine of not less than $25 or more than $200 for each offense.

According to Section 3, "this ordinance applies to proprietors, managers or lessors of halls or buildings used for such purposes, contestants, promoters, attendants and other persons participating in the conduct of the contest or the proceeds therefrom." Each day that such contest operates constitutes a new offense.

FREDERICK REX,
Librarian, Municipal Reference Library.

Portland Adopts a Renumbering Plan

PORTLAND, ORE.—A systematic scheme of house numbering will soon replace the present haphazard arrangement existing in Portland, Ore. The installation of a new numbering plan will begin shortly, and will probably be completed within two years. The new plan, adopted by ordinance several months ago, divides the city into five sections, which are designated North, North East, South East, South West, and North West. The creation of five rather than four general divisions was found necessary because the Willamette River comes to the center of the city in a northerly direction and then makes a turn to the northwest. Base lines are established dividing the city into four quadrants, and the northwest quadrant is further di-

vided into two sections. North and Northwest, on opposite sides of the river. The section designations will be used as prefixes to all street addresses. Their use as prefixes rather than suffixes was suggested by the Post Office.

All east-and-west thoroughfares in the entire city are to be designated "Streets" and those running north and south are to be designated "Avenues." A through street will be called a "Boulevard"; a half-block will be called a "Place" or "Court"; a winding thoroughfare will be known as a "Drive."

The "Philadelphia" system of house numbers, that is, allowing 100 numbers to the block, is followed under the new system. The existing standard system is to have 20 numbers to the block, although there are a good many individual variations in different sections of the city. Streets which formerly had several names in different sections of town, especially if broken, will under the plan have one name for the entire length.

A uniform style of house numbers is provided for by the ordinance. The city will supply and install the original numbers so as to secure uniformity both in design and location.

The plan carries out quite completely its purpose of simplifying the search for addresses in Portland. No compromises were made with those who desired minor exceptions, and as a result strangers as well as the natives will find it easy to find their way about Portland in the future.

The plan was worked out by a Citizens Committee of 35 representatives of civic and community clubs appointed by the Commissioner of Public Works upon his own volition. At the time that it was being subjected to criticism by various localities which were not satisfied with some single provision, a report by the City Club of Portland pointed out that the expense to various private concerns and to the Post Office was so great that no deviation from a complete and uniform plant could be tolerated. The Citizens Committee went on record at about the same time opposing all requests for minor variations.

It was estimated that the costs of changing address lists would approximate $500,000, although the actual cost of changing the house-number and street-name signs was estimated at less than $100,000. The Public Utilities and other large business concerns took the position that if a simplification of the house-numbering system were made final, they could recoup the amount of their expenditure by a reduction of costs during future years.

HERMAN KEHRLI,
Executive Secretary, City Club of Portland.

Tennis—A Year-Round Sport

MINNEAPOLIS, MINN.—Of the 150 tennis courts under the jurisdiction of our Board of Park Commissioners, 85 are constructed of concrete and the rest will be rebuilt in concrete as soon as funds are available. All new construction will be of reinforced concrete also. To keep courts of other types in condition, one caretaker is required for each four courts, on the average. Concrete courts require only the painting of lines about once every two years. The cost of building concrete courts with a heavy backstop and with durable fencing is approximately $1,500.

In 1916, two reinforced concrete tennis courts were constructed at Loring Park, as an experiment. Owing to the fact that these courts could be used at nearly all seasons of the year, they quickly became popular. Soon a definite program was laid out to build all Park Board courts of concrete, and this plan has been in operation since that time.

The even, true bounce of a tennis ball on a concrete surface makes playing a pleasure and increases the speed of the game, tending to develop more interest and efficiency among players. There are no imperfections in the surface to cause a "bad bounce" or to hold water after a thundershower.

Our tennis courts are in use for eight or more hours daily the year round except when storms are actually in progress or when snow or ice covers the playing surface. It is no unusual sight in the winter where tennis courts are adjacent to skating ponds to find the two sports areas in full use simultaneously.

We estimate that, without taking into account the many games of doubles, more than 750,000 persons enjoy the tennis facilities in the parks. Because of the popularity of the game, it has been found necessary to restrict juvenile players as far as possible to daytime hours, so that fathers, big brothers and sisters who must work in offices during business hours will have the use of the courts in the evening. The Board feels well repaid for its investment in concrete tennis courts, providing health for its citizens at low cost and maintenance-free recreational facilities usable on a practically year-round basis.

KARL B. RAYMOND,
Directors of Recreation, Board of Park Commissioners.

TENNIS IN FEBRUARY IN MINNEAPOLIS

Why not? When the courts are of concrete and the weather is pleasant? This scene is on Nicholl courts. The group of courts above, at the left, is in Loring Park

Waterbury's Unemployment Relief Plan Demonstrates Its Value

WATERBURY, CONN.—This typical industrial community of 100,000 people has had a unique unemployment relief program, inaugurated in November, 1930, the most important features of which are as follows:

1. A sum of over $600,000 has been raised by voluntary contribution in the form of weekly assessments of salary or wages, voluntarily agreed to by the employed and fortunate for the benefit of the unemployed and unfortunate.

2. Those earning less than $50 per week gave 1 per cent of their weekly incomes; those earning between $50 and $100 weekly gave 1½ per cent of their weekly incomes; those earning $100 or over gave 3 per cent of their weekly incomes; large corporations duplicated the contributions of their employees; wealthy citizens gave substantial donations approximating 10 per cent of the total given.

3. Approximately 30,000 people were contributors to the fund.

4. The fund was handled by a separate corporation formed to handle this specific problem, and so incorporated as to make donations to it exempt from income tax and to enable it to insure, as it did, those who were employed by it.

5. Employment was given to 1,964 people.

6. Relief in the form of employment, food, clothing or fuel was given directly or indirectly to 10,640 people, over 10 per cent of the population.

7. Not a cent of the relief fund came from city tax or bond issue.

8. Those employed by the relief corporation were engaged in various kinds of work beneficial to the city and its taxpayers, including the construction of a

nine-hole municipal golf course at a saving of probably $75,000 to the city; the construction of playgrounds; several projects of park development; the laying of water mains; street extension; wood cutting, to provide a large amount of fuel for the needy; a large clothing enterprise which collected, mended and distributed an enormous quantity of clothing to those in need of it; the painting and repairing of many municipal buildings; and a score of similiar projects.

The Waterbury unemployment plan has not only relieved the local situation directly, but indirectly has maintained the purchasing power of a large section of the community and therefore the circulation of money, resulting in the maintenance of a better condition of business. It was a practical plan, instituted with the enthusiasm of a war-time campaign, the response to which was wholehearted and universal, uniting the community in a common effort to dispel unemployment and depression. It was the very antithesis of the dole, and offered the opportunity of employment to those able and willing to work, in return for which it paid wages and secured benefits of a lasting nature to the community.

The plan continues in operation after completing practically its first year of existence, and has been copied by several other communities, including such a large city as Providence, R. I. It was, in effect, a voluntary local income tax plan, to which the greatest possible number contributed rather than the relatively few owners of real estate, and was a relief to the city and its taxpayers, already burdened with a sufficiently high bonded indebtedness and current tax rate.

THOMAS F. MOORE.

Vermont Sets Forth to Observe and Study Planning and Zoning

RUTLAND, VT.—From 20 communities in all parts of Vermont, 140 persons interested in zoning and city planning gathered in Glens Falls, N. Y., on October 16 to see what has been accomplished in that city, where zoning and city planning have been in progress for several years. This pilgrimage was sponsored by the Vermont State Chamber of Commerce and proved to be very illuminating. Vermont has recently passed a zoning enabling act and the time was ripe for such a trip of observation and study.

The members of the Glens Falls Planning Commission had offered their services in telling the Vermonters the experience of their city in zoning and planning. After a luncheon at the Queensbury Hotel, greetings were extended by John C. Fox, of Rutland, Vt., President of the Vermont State Chamber, and Walter W. Burbank, Chairman of its planning and zoning activities, who had organized the pilgrimage. The spokesman for the Glens Falls Planning Commission was its Chairman, Daniel Imrie. The other members of the Commission are Egbert W. West, Powel J. Smith, Miss Ruth Sherburne, who is secretary of recreational activities in the city, Dr. Fred G. Fielding and Charles McLaughlin. All these Commissioners were present at the luncheon, and several of them spoke; also J. Ward Russell, City Attorney, and Ernest Myer, who had prepared maps of the city for the Commission.

Some of the questions discussed are shown below.

Excellent work was done by *The Burlington Free Press and Times* and the *Rutland Herald* in reporting the facts brought out at the meeting. The whole undertaking was clearly and definitely managed, and stirred up much interest. Its effects were evidenced in the large audiences that listened to Gardner S. Rogers, Assistant Manager, Civic Development Department, Chamber of Commerce of the United States, in his Vermont tour, beginning October 22, during which he spoke at Bennington, Manchester, Rutland, Middlebury, Burlington and St. Albans. Vermont hopes to act intelligently and promptly in the matter of planning and zoning now that she has the legal authority.

JAMES P. TAYLOR,
Secretary, Vermont State Chamber of Commerce, Rutland, Vt.

Spokane Hires Her Own Unemployed

SPOKANE, WASH.—This city has taken steps to reduce street begging to a minimum even for the coming winter. Municipal officials have determined that, so long as there is necessary public work to be done, every able-bodied man who wants to earn his board and lodging shall have an opportunity to do it. Only when public work slackens will relief agencies be called upon to air regular unemployment appeals. "This year we hope largely to eliminate the drain on the charity of our citizens—and I think we shall succeed," a city official said recently. Last winter there was less street begging than for many years. Almost 250,000 man-hours of work were provided as an unemployment measure. Streets were graded, corners were widened and rounded, retaining walls were built, and county roads improved. This year, in addition to continuing this type of labor, work will be started on a sub-trunk sewer project which will increase the city payrolls many thousands of dollars.

The City Planning Commission also has recommended the improvement of two bypass streets and the construction

Ninety and Nine Vermonters Wanted by Walter F. Burbank, Chairman Vermont State Chamber of Commerce State-wide Committee on Planning and Zoning

A Planning and Zoning Pilgrimage

A TRIP OF OBSERVATION AND STUDY

To Glens Falls, N. Y.

FRIDAY, OCTOBER 16, 1931

PROGRAM: Lunch at the Queensbury Hotel, Glens Falls at 12:00 o'clock noon, sharp, with the Glens Falls Planning Commission as guests.
Discussions and Explanations and Questions.
Display of Maps and Charts and Pictures.
Tour of the City to Study Problems on the Ground.

SOME OF THE QUESTIONS TO BE DISCUSSED BY THE MEMBERS OF THE GLENS FALLS PLANNING COMMISSION FOR THE BENEFIT OF VISITING VERMONTERS

1. What is the set-up and what the methods of the Glens Falls, New York Planning Commission? What is their program of work?
2. What were the causes which led the people of Glens Falls to take an active interest in Planning and Zoning, and in the starting of the work through the appointment of a Planning Commission?
3. What is the history of the zoning idea in Glens Falls?
4. What losses and disadvantages are incurred by any community, village, town or city which fails to take up planning and zoning or which delays in this work?
5. What are the principal planning problems which face the City of Glens Falls now, and what is their importance?
6. How much technical advice is employed in your planning and zoning activities?
7. Into how many districts has the city been divided? Where do they lie? Where are their characteristics?
8. What advantages do you see accruing from your activities in planning and zoning? Who among the people reap the greatest advantages?
9. What is the work of defining building lines? What is your policy in this regard?
10. As a result of your study and experience of planning and zoning do you feel that your methods have value for us in Vermont?

PLEASE INFORM WALTER F. BURBANK, RUTLAND, VT. THAT YOU PLAN TO JOIN THIS PARTY AND WILL BE AT THE QUEENSBURY HOTEL READY TO SIT DOWN AT LUNCH AT 12:00 O'CLOCK NOON SHARP.

NOTE:—Glens Falls is southwest from Rutland, about fifty miles, a drive of from an hour and one half to two hours, from Rutland. Cars can be parked in the parking place at rear of Queensbury Hotel.

of a new 1,400-foot bridge over the Spokane River. Tentative plans for these two improvements are being prepared by the City Engineer and it is possible that work on the streets, which will require approximately five miles of paving, will be started in the near future. While the details of financing these projects have not yet been worked out, the state will be asked to contribute the major amount, with the possibility that the city and abutting property owners directly benefited will also share in the cost.

Last winter all physically able unemployed citizens who were married and had dependents were requested to register at the municipal employment office. After their records were checked, they were certified as eligible for jobs. When the work started, their rate of pay was $3 a day, payable one-half in cash and one-half in scrip, honored at all neighborhood stores in exchange for provisions. Single men and transients were given sleeping quarters in an abandoned brewery. They were also well fed and received necessary medical attention, as compensation for half a day's work. Those who needed clothing were usually supplied by relief agencies. The fact that the city was willing to feed men who would work was given publicity, and able-bodied beggars were directed to the abandoned brewery. Some went there, but most of them, after a few rebuffs, left town.

Many of the men who actually wanted to work stayed on and, according to city authorities, more than earned their keep.

ERIC A. JOHNSTON,
President, Chamber of Commerce.

"Made Work" Utilizing Automobile "Bones" Promises Big Improvement

HAWARDEN, IOWA.—In order to provide employment for its citizens, the city of Hawarden has entered into a project of city beautification. The banks of Dry Creek, which were washed away in the disastrous flood a few years ago, have been filled in with old automobile frames and bodies, and a crew of men and teams has been put to work hauling dirt to cover them and grade down the banks of the creek. As many as 74 men and teams have been at work daily for two weeks, as this is written, and are transforming the creek into a scenic beauty lane, winding through the city. Willows and refuse have been cleared from the channel, and ash and elm trees are being planted on the new filled-in banks. Councilman Sedgwick is in charge of the work.

In order that this labor may prove a real benefit to those employed, the city has purchased a carload of flour and two carloads of potatoes, and each man agrees to accept one-half of his pay in flour and potatoes. It is estimated that enough flour and potatoes will be furnished to the men to last their families through the winter. This foodstuff is handled by the city at cost, which allows each laborer considerably more provisions than would otherwise be possible.

Graveling and resurfacing of the city streets, which are not paved, will also be done to furnish additional employment, and plans are being made to hold a Pork Day and also a Wood Day. All the men will be given employment on Pork Day, and dressed pork will be delivered to their residences. On the Wood Day all the men will be employed in cutting down a grove of trees, which has been donated for this purpose, and the wood will be delivered to their homes, in compensation.

WORK ON THE HAWARDEN WATER PLANT

The city government of Hawarden is operated without making any tax levy, this being made possible through the municipal light and power plant, the profits of which take care of all the city expenses, including this welfare work. The population is 2,500.

B. T. French is Mayor. The Council consists of A. D. Coffman, Andrew McBride, Merritt Miller, Ben Rummel and Charles H. Sedgwick. W. C. Rush is Superintendent of the light and power plant, and C. A. Slife, City Treasurer.

FRED A. GEFKE,
City Clerk-Manager.

Making a Fire Station a Community Center

PORTLAND, ORE.—Until last spring, the fire station at Dekum and 8th Streets in Portland was just a fire station, a necessary, but not particularly attractive, part of community life. Then, because of the warping of the sidewalks by large tree-roots in the lawn about the structure, it was necessary to cut down a group of firs. Captain Wigginton, in charge, decided that they might be replaced by a pool, perhaps with goldfish and water-lilies. Then he thought of a fountain, a waterfall and a bridge. During their spare time, the captain and the six firemen created an exceedingly attractive spot. When, late in September, the community was officially invited to take part in its dedication, over a thousand people gathered for a street dance in front of the station, and for a program provided by their hosts. The plot was dedicated as Haines Park, in honor of Battalion Chief Haines. Haines Park has become one of the most popular community centers in the city.

The pool itself, about which interest gathers, is about 85 feet in circumference, with a sturdy cement footbridge. Trout dart tantalizingly back and forth. In the deeper lily beds a few sturgeon hide themselves. Perhaps the most interesting feature of the whole is the waterfall with its play of colored lights.

M. NORRIS DAVIS.

The Battle Creek Auditorium

THE illustration on page 103 of the November issue was incorrectly credited to Grand Rapids, instead of to Battle Creek, Mich., in connection with the item which it illustrated.

SELF-EXPRESSION FOR FIREMEN

This creation has made Haines Park one of the most popular centers in the city

The modern way to use Asphalt

Specify Bitumuls, instead of bitumens requiring heating, and build better work for less money. No heating. Inexpensive equipment. Simple to apply. The scientifically correct minimum of asphaltic binder furnished by Bitumuls safeguards against bleeding and rhythmic corrugations. Bitumuls pavements are durable, permanently non-skid and economical to maintain. Specify Bitumuls for all your paving. Write for a set of Bitumuls Bulletins. American Bitumuls Company, Dept. 4, 200 Bush St., San Francisco.

Illustrating the difference between Bitumuls (left bin) and hot asphalt (right bin). Note how Bitumuls penetrated the screenings, thoroughly and uniformly coating them, while the hot asphalt formed a mat and hardly penetrated.

BIT-U-MULS

Factories and Offices: BOSTON, BALTIMORE, CINCINNATI, ST. LOUIS, BATON ROUGE, LOS ANGELES, PORTLAND, ORE. *Executive Offices:* SAN FRANCISCO.

THE TAXPAYER'S DOLLAR

A Monthly Department of Budgeting, Assessment, Taxation, Accounting and Other Phases of Municipal Finance, Conducted by A. E. BUCK, National Institute of Public Administration, New York

New York City's Budget Made an Object of Political Horseplay

THE tentative budget of New York City for 1932, published on October 10, totaled $631,352,880.39. This amount was 10½ millions above the comparable budget figure of 1931. In a message accompanying the tentative budget, Mayor Walker sought to explain that this increase was unavoidable owing to mandatory charges and the existing unemployment situation. He indicated, however, that additional expenditures were to be made from "miscellaneous revenues" to the amount of $66,303,931.42, or a grand total for the year of $697,656,611.81. He estimated that $506,000,000 of this total must be raised by direct property tax and that the basic rate would be $2.54, as against $2.57 the current year.

The budget was immediately attacked by real estate officials and civic associations, led by Peter Grimm, President of the Real Estate Board, who deemed the increase "political if not financial suicide." Public hearings on the tentative budget were held at the City Hall on October 14 and 15. Representatives of taxpayers and several private agencies appeared and registered protests, but they were without ammunition to wage battle against the Board of Estimate and Apportionment. After these hearings were over, Mayor Walker announced that the Board would devote its time to a reduction of the tentative budget figures. Comptroller Berry stated that he was opposed to any increase in the 1932 budget over that of the current year.

The proposed budget, as accepted on October 20, amounted to $631,366,317.97, or more than $13,000 in excess of the tentative figures. Public hearings were again held on October 22 and 23, at which many protests were registered. It was urged that the budget could be pared down some $2,500,000 by cutting all salaries above $7,500 to the 1926 scale, but this did not seem to appeal to the members of the Board of Estimate who had raised their own salaries in 1929. Several other suggestions were made made for retrenchment, but these likewise fell on deaf ears.

An attempt of the Board of Estimate to agree upon the final figures of the budget in executive session was disrupted by Comptroller Berry's giving out to the newspapers a statement in which he claimed that a reduction of some $14,000,000 could be made. This angered Mayor Walker to such an extent that he called an open meeting of the Board at the City Hall on October 31, the final day for adoption of the budget by this body. This meeting was staged with microphones of the city broadcasting station picking up the verbal proceedings. The Comptroller's statement was read, questions were propounded by the Mayor, answers were solicited from city officials, and the Comptroller now and then interposed rejoinders. It was political horseplay, but the crowd that jammed the Board of Estimate hall seemed to relish it. At the end of a six-hour session, the Comptroller was outvoted. The budget for 1932, as finally adopted by the Board, stood at $631,366,297.97, the only change made being the correction of a small clerical error. The budget now goes to the Board of Aldermen, which may reduce it, but has not seen fit to exercise this power for several years.

Scheme of Budgeting Adopted for Connecticut Towns

THE Connecticut Legislature of 1931 provided a method for the preparation of the budget in those towns which have boards of finance organized under the provisions of the general statutes. Of the 169 towns in the state, 67 have boards of finance or the equivalent, but only 31 of this latter group meet the requirements of the general statutes. So what seems to be a state-wide application of budgeting to towns is, in fact, rather limited. But it is hoped, says William H. Blodgett, State Tax Commissioner, that towns having boards of finance created by special act, and towns having no boards of finance, will take advantage of the provisions for budgeting.

Mr. Blodgett has designed a manual prescribing the form of the town budget reports. This manual outlines the set-up of a complete budget, emphasizing the balancing of income and outgo. It should be most helpful to the town officials in financial planning. There is some doubt as to how far it can be followed, owing to the lack of uniformity in the town accounting systems. It is possible, however, for the town governments to revise their accounting so it will harmonize with the budget procedure. In this work, the State Tax Commissioner's office can render valuable assistance.

Florida Supreme Court Upholds Miami's Plan for Refunding Bonds

THE Supreme Court of Florida recently upheld the validity of a $16,000,000 refunding program contemplated by the city of Miami. This program is expected to place the city government in a position so it can meet its debt service requirements. At present the city has $32,000,000 of bonds outstanding, which require annual interest charges of about $1,600,000 and redemption charges of about $1,900,000, making a total debt service of $3,500,000, which is more than the community can meet. The refunding plan will replace the bonds falling due before 1941 with other securities so distributed as to maturities that the debt service will approximate $2,000,000 annually for the next ten years. This will enable the city to make ends meet financially, in view of the fact that the city authorities have already made drastic cuts in the operating expenses, reported to be something like 60 per cent over those of 1926, when the boom was at its height.

The refunding bonds are to be issued par for par and at a rate of interest not to exceed 6 per cent. Holders of the present bonds are said to be eager to exchange them in most cases, especially the bonds which have already matured and have not been redeemed. Some of the maturities date back to May, 1930.

Financial Administration in the Cities and Counties of New Jersey Surveyed

THE Commission to Investigate County and Municipal Taxation and Expenditures in New Jersey has issued Report No. 3, which contains its findings and recommendations on "Municipal and County Financial Administration." The staff work of this Commission is being conducted under the direction of Professor H. L. Lutz of Princeton.

Fifteen years ago New Jersey adopted legislation sponsored by Senator Arthur N. Pierson, which then placed it among the leaders in local financial regulation and control. This legislation corrected many of the earlier abuses in borowing, spending and accounting. Recent experience, however, has disclosed several defects in the original legislation and the amendments thereto. Report No. 3 surveys these defects and proposes a program of revision, with special emphasis on expenditure control, a feature that was lacking in the earlier legislation.

Several weaknesses are pointed out in the present financial procedure. The most important one relates to budgetary control. "The budget," says the Commission, "has not been made the instrument of expenditure control. Accounts have not been established with a view to developing and comparing costs. Auditing has not been conducted in a manner which would permit it generally to embrace criticism of patronage and waste. Typical state laws which interfere with local 'home rule' have imposed mandatory expenditures running into millions of dollars. These laws are often to promote some desired objective but are unaccompanied by material limitations and checks to prevent extravagance." The Commission goes on to state: "At the

BUILDERS of HOOVER DAM Select INTERNATIONAL TRUCKS

"Six Companies Inc.," Builders of Greatest Engineering Project Since the Panama Canal, Place Large Order Exclusively with International Harvester

The Hoover Dam region on the Nevada-Arizona line.

HOOVER DAM is under way. The great Boulder Canyon project of the United States Government which has long made news for a nation now advances into construction stages.

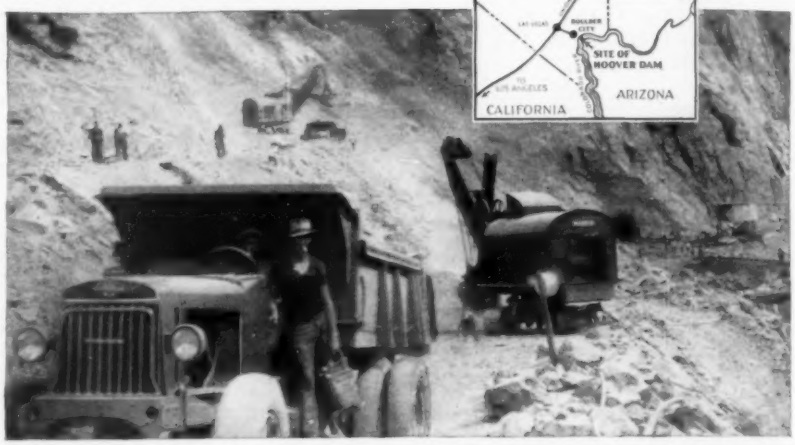
And as action begins on the mighty Colorado, comes a news item of vital interest to the construction industry and to the automotive world. Six Companies Inc., of San Francisco, a combination of six leading western contractors which is to build Hoover Dam under a bid of $48,890,999, has standardized on International Trucks as qualified above all others to bear the heavy hauling responsibilities in their contract.

The full meaning of this decision—the extent of the honor paid to International performance and service—can be appreciated only when measured against the immensity of the project itself.

The Job—

Space does not permit going into the details of the Hoover Dam project. They have long been matters of public record. Suffice it here to say that the plan encompasses flood control and general river regulation, irrigation, silt control, power development and domestic water supply affecting a large part of the Southwest. The entire enterprise involves an appropriation of $165,000,000 and includes many auxiliary developments of great magnitude in addition to the dam itself.

The dam will fill the gigantic chasm of the Colorado River to a height of about 730 feet above the foundations. It will be one-eighth of a mile thick at the base, will contain about 3,400,000 cubic yards of concrete, and will impound 30,500,000 acre-feet of water in an area vastly greater than Gatun Lake at the Panama Canal. Millions of yards of rock and earth must be removed; millions of tons of building material must be hauled. Employment will be given to thousands of men, the work extending over a period of six to seven years.



One of the International heavy-duty trucks working at Hoover Dam. The open hood is expressive of the intense heat in the canyon, rising as high as 128 degrees. The boulder-proof armored cab is further evidence of conditions encountered. Note, at right of shovel, the entrance to an auxiliary tunnel used in construction of the great diversion tunnels that will extend three miles through solid rock.

Today the canyon hums with intense activity. "Boulder City" is springing into being like a magic town of gold or oil. Railways and highways are being built. Modern engineering genius is mobilizing to conquer problems that stagger the imagination. Already work has begun on four great diversion tunnels each 50 feet in diameter and nearly a mile long, to be driven through the solid rock of the canyon walls. These channels alone involve the hauling of *nearly a million truck loads.*

—and the Trucks

In such a setting, with mountains to be moved under such conditions, trucks will have their work cut out for them. Six Companies Inc., guided by years of experience in heavy-duty hauling, is banking on Internationals. The fine performance of Internationals in the service of the first sub-contractors on work in the canyon only made the choice the easier. Scores of International Trucks are now in process of delivery at the site. The first fleets have long been on the job, rugged, capable, and economical—admired alike by the engineers, the drivers and the shovelmen who know full well how good each truck must be to stand the gaff.

Hoover Dam as it will look on completion, towering 730 feet above foundation rock, with power houses on both banks of the river. The dam will be nearly 1200 feet long, 45 feet thick at the top, and 650 feet thick at the base. This barrier will form a reservoir 115 miles in length with a shore line of 550 miles and an area of 227 square miles, the largest artificial lake in the world.

Front of dam will rise just beyond foot bridge shown here. Hoover Dam will be higher than any dam now existing and the construction will require 5,500,000 barrels of cement and nearly 60,000 tons of steel and other metals.

International Harvester is proud to have Internationals selected for work on Hoover Dam. The news from Boulder Canyon is of great practical value to buyers of trucks everywhere. It provides another chapter of evidence contributing to the high reputation of International Trucks.

INTERNATIONAL HARVESTER COMPANY OF AMERICA (INCORPORATED)
606 S. Michigan Ave. Chicago, Ill.

present time many municipalities find themselves in serious financial condition, and a majority of all municipalities are carrying an enormous burden of floating debt, because, while following the law, they have not in fact balanced their budgets." The Commission observes further that "the absence of adequate internal check has invited fraud and offered temptation to public officers."

The Commission makes several major recommendations. It proposes the abolition of mandatory expenditures, the budgeting of all local expenditures, the establishment of adequate accounting systems, the setting-up of expenditure control, current reporting of financial operations, readjustment of the financial organization and personnel, tax collection by the county agents, and a revision of the special assessment procedure.

Those interested in the finances of local governments will find Report No. 3 a valuable document. It marshals a lot of material in brief compass. Its recommendations, although intended for New Jersey, have a much broader application.

Detroit Adopts a System of Quarterly Allotments to Meet Fiscal Difficulties

IN order to balance its budget for the current fiscal year, beginning last July 1, the city of Detroit adopted a system of quarterly allotments. This system was inaugurated by an ordinance passed by the City Council and approved on May 5. Shortly thereafter the budget director, W. J. Curran, an officer in the city controller's department, issued instructions to the various city departments for the preparation of the allotments. All appropriations are apportioned, excluding regular salaries, and a one per cent reserve is set up. The allotments are made for the entire year at the beginning of the fiscal year, and are revised as conditions seem to warrant during the year. Expenditure control is exercised by the controller on the basis of the allotments.

The aid of the various departmental heads is required in preparing the original allotments. In fact, blanks are sent to each department by the budget director to be filled out and returned. The amounts allotted are finally agreed upon jointly by the department head concerned, the controller, and the budget director; the mayor and council having the power of review and approval. These amounts are then entered on the controller's books and serve as the limits of expenditure. The reserve, when necessary, may be released by the controller with the approval of the mayor and council.

The budget director makes quarterly analyses of revenue and other receipts. The departments are informed of the rate at which the income flows into the city treasury. In case it fails to materialize as estimated, the departments are required to reduce their expenditures to conform with the actual receipts. These reductions are made in the quarter immediately succeeding the one in which the deficit is noted.

Mr. Curran reports that the system to date has shown some truly remarkable results. Some adjustments have been necessary in the first and second quarterly allotments, owing to the fact that the departmental records were not designed to give a picture of the quarterly requirements. But these adjustments have been few and of a minor character. While the quarterly expenditures of the departments have not been brought down to the basis of the quarterly receipts, this is in the process of being accomplished through drastic reductions. The chief advantage of the system, says Mr. Curran, is to prevent the creation of any further deficits while those which have accumulated in the past are being liquidated.

The Municipal Bond Market

By SANDERS SHANKS, JR.
Editor, *The Bond Buyer*

IT is difficult to present a picture of the municipal bond market of recent weeks by reference to the reports of issues sold during this unprecedented period. The record indicates that a number of obscure communities have been able to place loans on terms which do not reflect the serious disturbances in the securities markets, while prominent cities and several states have experienced great difficulty in negotiating loans and the ones which have succeeded have had to pay rates quite different from those prevailing for identical credits as recently as mid-September.

In the case of the smaller places, it is probable that the accommodation was secured locally and that other considerations than the price actually paid for the bonds or notes entered into the transactions; in other words, the bare, official record does not tell the whole story. As to the larger places, the complete story is generally known to the entire bond fraternity. In the case of Jersey City, for instance, public offering of $4,359,000 bonds brought no bids, but the issue was later sold privately as 5 per cent bonds, and a successful reoffering of the issue at a price to yield 4.75 per cent pretty definitely establishes the true market level for bonds of that city and other comparable communities.

Another excellent index to market values is the recent underwriting and retail distribution of $5,000,000 state of Missouri bonds. Priced to yield 4¼ per cent, these bonds were quickly sold, and within a week they were being held for a price to net 4 per cent. This experience was repeated in the case of a substantial block of Baltimore bonds, the offering price early in November of a 4⅛ per cent basis being subsequently changed to a 4.10 per cent basis without slowing up investment buying of the issue.

The market at this writing (November 24) is as yet in a far from satisfactory condition. Dealers are unable to resume normal underwriting activities because of the unwillingness of banks to extend to them credit on reasonable terms. So long as this condition lasts, dealers cannot support the market and will do only a hand-to-mouth business. In too many instances, this must mean that cities, counties, etc., will receive no bids for new issues and will be forced to make special arrangements whereby a dealer or group of dealers will be given an option on an issue and allowed a month or more to go out and see if they can sell the bonds. Meantime, municipal bonds as a class are suffering a severe blow to their prestige. Investors are shocked when they check the market for their holdings and receive another shock when they ask a bank to lend money against them. This unfortunate bank situation is almost entirely responsible for the chaotic condition of the municipal bond market. It is natural for the investor to assume that there is something seriously wrong with municipal finance when prices of bonds of the best places can break so sharply. As a matter of fact, there is little basis for any such assumption, generally speaking. It is all part of the general economic breakdown, in which even the Federal Government has finally found its credit suffering from an attack of nerves on the part of bankers as well as of the less well-informed and economically-trained ordinary investor.

The following representative list of sales of state and municipal issues indicates the current level of municipal bond prices:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$4,680	Adams Co., Ind.	4	6 1/3-yr. (avg.)	3.82
26,020	Dedham, Mass.	4¼	1-yr.	4.20
1,000,000	Oregon	4¼	15-yr. (avg.)	4.34
7,478,000	Boston, Mass.	3¾, 4¼, 4⅜	1-50-yr. (ser.)	4.37
5,000,000	Missouri	4	17-21-yr. (ser.)	4.38
250,000	Beaver Co., Pa.	4½	11½-yr. (avg.)	4.45
90,000	Redlands, Calif.	4¾	11 1/3-yr. (avg.)	4.60
1,350,000	Dallas, Texas	4½	15½-yr. (avg.)	4.64
339,000	Eastchester, N. Y.	5	7½-yr. (avg.)	4.87
4,359,000	Jersey City, N. J.	5	14 1/6-yr. (avg.)	5.00
113,200	Springfield, Ohio	5¼	14-yr. (avg.)	5.16
207,000	Hempstead, N. Y., Sewer Dist.	5.40	21¾-yr. (avg.)	5.37
7,500,000	Detroit, Mich.	4½	3-mos.	5.95
297,717	Milwaukee Co., Wis.	6	5-yr. (avg.)	5.99

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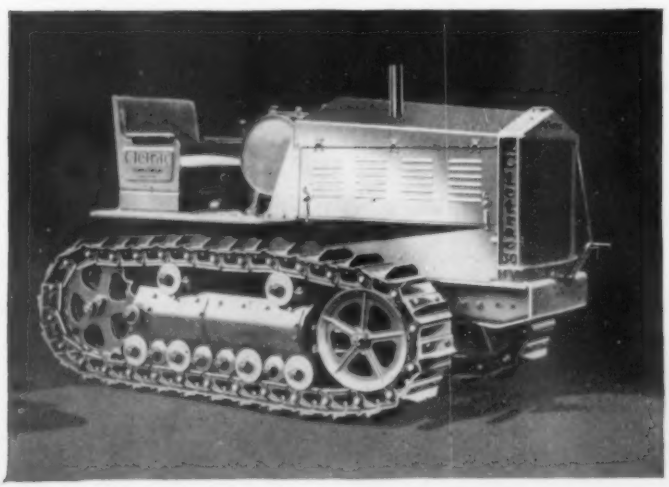
HERE ARE 5 TRACTOR SIZES —FIFTEEN TO EIGHTY H. P.— *to meet* EVERY POWER NEED

THERE are no jobs too big or too little for Cletrac Crawler Tractors. They are built in a complete line-up of sizes to match the requirements of your entire range of work. Whether it's a power-eating job with big elevating graders or the comparatively small operation of a half yard fresno, there's a Cletrac size to fit—and save you money on the job.



Cletrac Crawlers are real money-savers and money-makers on any job they tackle. They deliver their full rated power at the draw-bar and still have a 25% margin in reserve for over-loads. They travel fast and go anywhere on their broad, sure-gripping tracks. They maneuver nimbly and can be swung around with only finger pressure at the controls.

You will like Cletrac's features of patented planetary gear steering, the sturdy construction and simplified engineering, the complete dust-proofing and continuous oiling that saves time and repair costs.

Get the complete story of these efficient tractors and how they can serve you better and more economically. The Cletrac distributor near you will gladly demonstrate—or write direct for full information.

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CLETRAC
CRAWLER TRACTORS

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Sewage Disposal

Adjacent property owners held entitled to compensation for depreciation of land value through establishment of sewage disposal plant.

A statutory and constitutional provision for the payment of compensation for the "damaging of private property for public use" entitled landowners to awards for depreciated land values, caused by fumes and insects coming from a nearby municipal sewage plant. (*Aliverti v. City of Walla Walla*, 298 Pac. 698.)

Business Regulations

City upheld in imposing heavier license tax for selling non-intoxicating liquors for consumption on premises than for consumption elsewhere.

In the case of *City of Milwaukee v. Kaun*, 235 N. W. 551, attack was made upon an ordinance that imposed license taxes upon the business of retailing non-intoxicating liquors, because the tax was much higher for selling for consumption on the premises than for consumption elsewhere. Said the Wisconsin Supreme Court:

"Traffic in non-intoxicating liquors is subject to regulation. . . . The common council of the city of Milwaukee has authority to provide for the granting of licenses, to such persons as they deem proper, for the sale of non-intoxicating liquor, and they may look beyond the mere mercantile transaction to the results likely to follow in the wake of this traffic in deciding upon a basis for classification of persons engaging in this business. Consideration is to be given to the opportunity for law violations and the tendency toward disorder.

"The ordinance recognizes two classes, namely, those who sell non-intoxicating liquors to be consumed on the premises where sold and those who sell non-intoxicating liquors not to be consumed on the premises where sold, and fixes the license fee for the first class at $50 and for the second a fee of $5. . . .

"The police power may be exercised for the regulation of an occupation for the purpose of law enforcement, securing the public health, safety, and welfare. . . .

"It is generally understood that, a proper basis for classification existing, and natural and reasonable ground therefor appearing, legislation recognizing the distinction and affecting all within the class equally does not offend against the constitutional regulations protecting individual rights.

"As the ordinance is for the purpose of regulating a business which is subject to regulation, the limitations are a matter of discretion and policy. . . . The classification being legitimate and proper and all in the same class being treated alike, the ordinance is not discriminatory."

Municipal Officers

Statute held to disqualify councilman for clerkship during term of office.—Taxpayer held entitled to challenge right to office.

The New Jersey Borough Act is so worded as to render a councilman ineligible for appointment to the office of borough clerk during the term for which he was elected councilman, according to the New Jersey Supreme Court in the case of *Walton v. Brindle*, 154 Atl. 524.

It was also decided that, under another statute, a borough resident and taxpayer may bring a *quo warranto* proceeding to test an incumbent's right to an office without being himself entitled to the office.

Hospital Management

If city negligently and prematurely removes a pay patient from its isolation hospital, it is liable in damages.

A claim stated on its face right to damages from a city operating an isolation hospital where it averred that the city had wrongfully and prematurely removed a scarlet fever patient from the municipal isolation hospital, where he had been received as a pay patient, resulting in his death. Reaching that conclusion in the case of *Anderson v. City of Portland*, 154 Atl. 572, the Main Supreme Judicial Court said:

"A municipality maintaining a hospital of that kind, only for the public welfare, is not liable to a private action for neglect to perform, or the negligent performance of, duties legislatively imposed on it, unless right of action has been given by statute. . . .

"But the declaration sets out, in effect, in the particular instance, the defendant city with not discharging duties partaking of the nature of a governmental power. On the other hand, assertion is, that realm was left, and one entered, albeit casually, in which the rules which regulate the responsibility of business corporations are applicable."

Street Vacation

Vacation of street intersecting street on which abutter owned property did not entitle him to damages.

When the city of Portland vacated part of a street for school-ground purposes, an owner of lots on an intersecting street, opposite one end of the street vacated, was awarded $1,750 damages. But the award was dismissed by the Oregon Supreme Court on an appeal taken by the city. (*Cook v. City of Portland*, 298 Pac. 900.) The opinion recognized the following stated rules:

"Courts have been unable to announce any hard-and-fast rule to determine when owners may and when they may not recover compensation for injury to property by reason of the vacation of a street. However, it may be said with a degree of certainty that an owner whose property abuts upon that part of the street vacated is entitled to be compensated for deprivation of his right of access to his property. It is also a well-established general rule that those owners whose property does not abut upon the street vacated are denied compensation if they still have access to the general system of streets. . . . The mere fact, however, that the property does not abut on the street vacated does not preclude compensation if the owner has been deprived of all access to his property. This could be accomplished by the vacation of streets on both sides of a property or by closing all of the street except that part upon which the property abuts. The real test is not whether the property abuts upon the street vacated, but whether a special injury has been sustained by reason of the vacation. . . .

"The weight of authority supports the proposition that, where a street upon which an owner's property abuts is closed at one end of the block, leaving the property in a cul de sac, the owner is entitled to damages."

City Prisons

Ordinance reducing fee for feeding city prisoners was not an unconstitutional reduction of the city jailer's salary during his term of office.

During the term of plaintiff's office as city jailer an ordinance allowing him 30 cents per meal for feeding prisoners was amended so as to reduce the allowance to 20 cents. He unsuccessfully attacked the amendatory ordinance as violating a prohibition of the Kentucky constitution against changing the compensation of city officials, etc., during their term of office. The Kentucky Court of Appeals decided (*Howell v. City of Ashland*, 39 S. W. 2d, 468) that there was no statutory duty resting upon city jailers to provide food for prisoners; therefore, the allowance could not be regarded as compensation for performance of official duty.

Miniature Golf

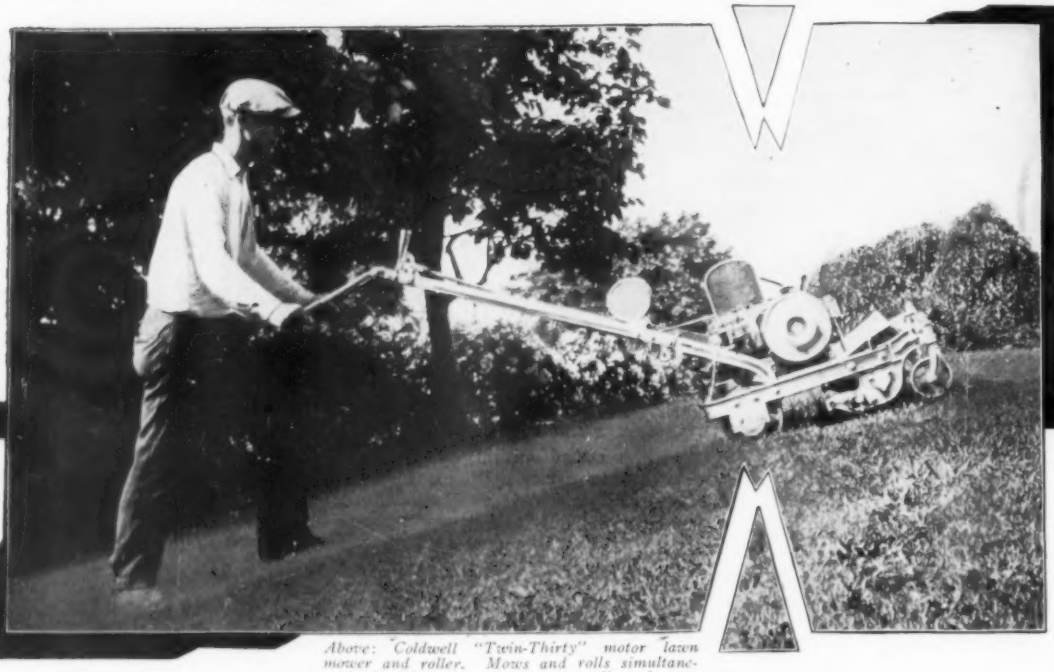
Miniature golf courses come under a statute authorizing licensing of "public amusements" to which admission is charged.

Although admission to a miniature golf course is free, only green fees being charged, it falls within a statute empowering municipal authorities to license "amusements . . . to which admission is obtained upon payment of money," etc., declared the Massachusetts Supreme Judicial Court in the case of *Jaffarian v. Building Commissioner of City of Somerville*, 175 N. E. 641. In the course of the discussion, the Court said:

"The characteristics of miniature golf courses are of such a nature as to render proper their regulation under the police

SINCE 1867

COLDWELL POWER



Above: "Coldwell "Twin-Thirty" motor lawn mower and roller. Mows and rolls simultaneously 6 to 8 acres a day on one gallon of gasoline. Riding sulky may be had as extra equipment.

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power. . . . The right to require licenses is based on the conception that places of amusement may require supervision by public authorities to the end that they may not degenerate and become obnoxious to the public welfare. Miniature golf courses fall under this general principle."

Detaching Territory

Statute authorizing detachment of agricultural lands from city held not unconstitutional as omitting provision for notice to all landowners nor as being special legislation.

A Minnesota statute authorizes the owners of 75 per cent or more of unplatted lands used exclusively for agricultural or horticultural lands in a city of 10,000 population or less to petition the district court for detachment of the same from the city. The act does not apply to a city having less than 3,000 acres of such lands nor to a city whose limits are not identical with the limits of a school district.

In the case of *Clinton Falls Nursery Co.*, 236 N. W. 195, a district court had found that the statutory conditions existed, but dismissed a petition on the ground that the statute was unconstitutional. Reversing the decision, the Minnesota Supreme Court said:

"It is claimed that the statute is unconstitutional because it does not provide for notice to the landowners whose land is detached. All of the landowners joined in the petition except the state and the railroads. Municipal corporations, such as cities and school districts, are in a sense agencies of the state. The Legislature may determine their boundaries and provide for the annexation and detaching of territory. . . . Doing so without notice to the parties whose lands are annexed or detached is not a taking without due process. . . . The failure of the statute to provide for notice to owners does not render it unconstitutional for want of due process or upon other grounds.

"The other claim of unconstitutionality is that the statute is class or special legislation inhibited by . . . the Constitution. . . .

"A statute is presumed to be constitutional. Whether it is special is a judicial question. Yet the classification is first for the Legislature, and its judgment is to be respected. The requirement that there be 3,000 acres devoted to agricultural or horticultural lands before the statute applies is not arbitrary. If there is more than that amount of land so used in a city of 10,000, or less, there is a suggestion that a body of rural land is included with land which is urban; and, besides, some amount is properly left for future development. The limit must be fixed somewhere. It is much a question of policy. . . . We find nothing in the statute which leads us to hold it unconstitutional as special legislation. There is some discretion in the Legislature in adopting a construction. They know more about the subject upon which they legislate than we do. A classification need not be perfect. There are questions of practicability."

Municipal Playgrounds

Cities held not liable for accidents in operation unless negligent.

Assuming that a woman passing a public playground was struck by a baseball thrown by one youngster to another, the city was not liable to her in damages, because not negligent, ruled the Appellate Division of the New York Supreme Court in *Lane v. City of Buffalo*, 250 N. Y. 579. Speaking for a majority of the Court, Mr. Justice Elgcomb said, in part:

"I agree with Judge Thompson that, in maintaining its recreation centers, the defendant was acting in a corporate and not in a governmental capacity, and is, therefore, liable for its negligence. . . .

"I am unable, however, to reach the conclusion that the defendant has been shown guilty of any negligence which caused the accident in question. . . .

"The city was not bound to anticipate danger to persons lawfully on adjoining property, if two small boys were permitted to play catch on this playground. There was nothing inherently dangerous about the game. It is common knowledge that a similar sport is indulged in by boys upon the public streets, and vacant lots in every city and village, ofttimes in thickly populated centers, and no one considers that danger is liable to ensue to the public, if the game is allowed to continue. This is not the case where a ball game is permitted to be played on grounds near a public street, and where balls are batted long distances with considerable force, and are liable to strike and injure persons on the highway, as was the case in *Lamm v. City of Buffalo*, 225 App. Div. 599, 233 N. Y. S. 516. . . .

"If knowledge is brought home to the city that any sport conducted on its playgrounds has caused, or is likely to cause, injury to persons lawfully on the highway or on adjoining property, then undoubtedly it would be the duty of the municipality to use reasonable care to obviate such danger and, if necessary, to stop such games, and if it failed to do so, it would be negligent."

Violating Injunctions

Municipality and guilty officials may be punished for contempt of a court injunction.

Continued pollution of a stream by the sewage system of a municipality, which has been enjoined from such further pollution, is a contempt of court, not only by the municipality, but also by the individual members of the governing body of such municipality, who have failed to take such steps as lay within their power to endeavor to accomplish the cessation of the pollution enjoined.

If, in such a case, circumstances exist or arise which, in the opinion of the members of such governing body, require or justify delay in the cessation of the pollution enjoined, disobedience of the injunction is not thereby excused; application should be made to the court for modification or temporary stay of the injunction.

Reaching these conclusions in *Contempt Proceedings against the Borough of Fort Lee*. 155 Atl. 473, the New Jersey Court of Chancery imposed a $500 fine against the borough and a $100 fine against each of the borough officers found guilty of violating the injunction involved. In the course of its opinion, the Court said:

"Obviously, the borough acts, and can act, only by its mayor and council. The responsibility rests upon them for the performance or non-performance by the borough of its legal duties. Violation by the borough of an injunction, involves, at least prima facie, guilt on the part of one or more of the mayor and council, of the same criminal or quasi-criminal offense. Both a corporation and its individual officers, directors, and agents may be guilty and punishable for the same offense. . . .

"Neither the lack of disrespectful intent, nor the failure to realize the character of their neglect or refusal to cease the pollution constitutes any defense to the charge of contempt, . . . but may properly be considered in mitigation of punishment."

Shade Trees

Abutter owning title in fee to center of street was not subject to a statutory penalty for cutting a tree in the street, it being dangerous through decay.

Village of Cattaraugus v. Johnson, 249 N. Y., S. 327, was a suit brought to recover a penalty under the New York Village Law, for destroying a shade tree in a street. Dismissing the suit, the Cattaraugus County Court said:

"It is evident that the purpose of this section of the Village Law and ordinance which was enacted under it . . . was to preserve shade trees which were located in public places, so as to preserve their beauty for public enjoyment. . . . The tree which was cut by the defendant was not a shade tree within the commonly accepted meaning of that term. Instead of being a shade tree, it was a decayed tree and a menace to the traveling public. If defendant had permitted it to stand after being informed of its condition by experts, he might have become liable for damages to parties suffering injuries.

"The defendant owns the title in fee to the center of the street. This is a different situation than if the defendant was, strictly speaking, an 'abutting' owner; that is, his title running merely to the boundaries of the street. In cases where a lot owner has title in fee to the center of the street, it is well settled by abundant authority in this state that the only title or right which the municipality has is an easement for the construction and maintenance of the street. They have no right to interfere with shrubbery or trees or any other part of the freehold lying within the boundary of the street, except when the same interferes with the proper use of the village for street purposes. The authority of the village is paramount when it is necessary to use the land for street purposes."

The above municipal tennis courts in beautiful Byrd Park, Richmond, Va., are surfaced with

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Chattanooga, Tenn.

Local Assessments

Cemetery lands in Pennsylvania are not exempt from sewer assessments on a front-foot basis, although not specially benefited.

A cemetery association contested an assessment for a sanitary sewer improvement constructed in an abutting street, on the ground of lack of benefit. It was virtually conceded that a statutory and constitutional exemption of cemetery land from "taxation" did not entitle the association to exemption from special assessments. The claim was that the improvement was without benefit to the cemetery lands. On that point the Pennsylvania Supreme Court said (*Borough of Elizabethtown v. Mt. Tunnel Cemetery* Co., 154 Atl. 482) in the opinion as here quoted in part:

"The charge here in question was made under section 6, article 12, chapter 6, of the General Borough Act of May 15, P. L., authorizing assessments upon all property holders according to the foot frontage of property situated on the street in which the sewer is constructed, and not, as the act also permits, for resulting benefits."

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Housing—Exemption from Taxation

NEW YORK.—*Mars Realty Corporation v. Sexton*, Supreme Court, Bronx County, reported in *N. Y. Law Journal*, October 23, 1931. This is an action by taxpayers claiming that a local law granting exemption from taxation for a term of years to limited dividend corporations under the state law is unconstitutional. *Held*, that the law is valid. The state law under which the local law was passed is entitled, "An act to promote the public health and safety by providing for the elimination of unsanitary and dangerous housing conditions, to relieve congested areas, and the construction and supervision of dwellings and the letting of apartments at reasonable rentals."

The legislative finding as contained in the law declares that congested and unsanitary housing conditions exist in certain parts of the state and are a public menace, etc. The correction of these conditions in these areas being otherwise impossible, it is essential that provision for the investment of private funds at low interest rates, the acquisition at fair prices of adequate parcels of land, and the construction of new housing facilities under public supervision (as the law provides) at a low cost, be made. It is immaterial that the land exempted is not in immediate propinquity to a congested area, since constructions at a somewhat greater distance will nevertheless be a relief.

Zoning — Consents — Garages

NEW YORK.—*Matter of Ballard v. Roth*, 141 Misc. 319.—The provision in the zoning ordinance of the city of North Tonawanda that "any person requesting a permit for the installation of gasoline pumps and the erection of a public gasoline station shall accompany the request with a sworn petition signed by two-thirds of the resident property owners within a radius of 500 feet of the boundaries of the proposed location" is invalid, since it substitutes the action, or failure to act, of those whose interest may make them adverse in place of the judgment of a tribunal constituted pursuant to law.

Such a provision must not be confused with one allowing the consents of property owners to *waive* a restriction. Such a provision is valid.

PENNSYLVANIA.—*Appeal of Perrin*, 156 Atl. 305.—The operation of a gasoline filling station in a purely residential district would constitute a nuisance, regardless of a zoning ordinance.

A zoning ordinance prohibiting the erection of a gasoline station in a commercial district but permitting it with the consent of adjoining owners, is valid.

Zoning—Meaning of Word "Premises"

NEW YORK.—*People v. Jones*, Court of Special Sessions, City of New York, October 8, 1931.—The defendant operates a "parking space," situated in a business district in New York City, on which he allows to be parked, for compensation, never less than six, and at times as many as sixty, cars at a time. The New York Zoning Resolution provides that "no building or premises" shall be used for the storage of more than five motor vehicles, or as garage for more than five such vehicles in such districts. *Held*, that the word "premises" includes land, and forbids its occupancy as above, and that the defendant was therefore guilty of violating the zoning resolution of the city.

Zoning—Industrial District—Nuisance

MASSACHUSETTS.—*Marshall v. Holbrook*, 177 N. E. 504.—The defendant has erected a drop forge furnace in a neighborhood of a mixed residential and industrial character, zoned as industrial. The factory is a great disturbance to the plaintiff, who resides in the district near it. *Held*, that the factory was a nuisance, but as no evidence of the amount of damage was introduced, no damages could be awarded.

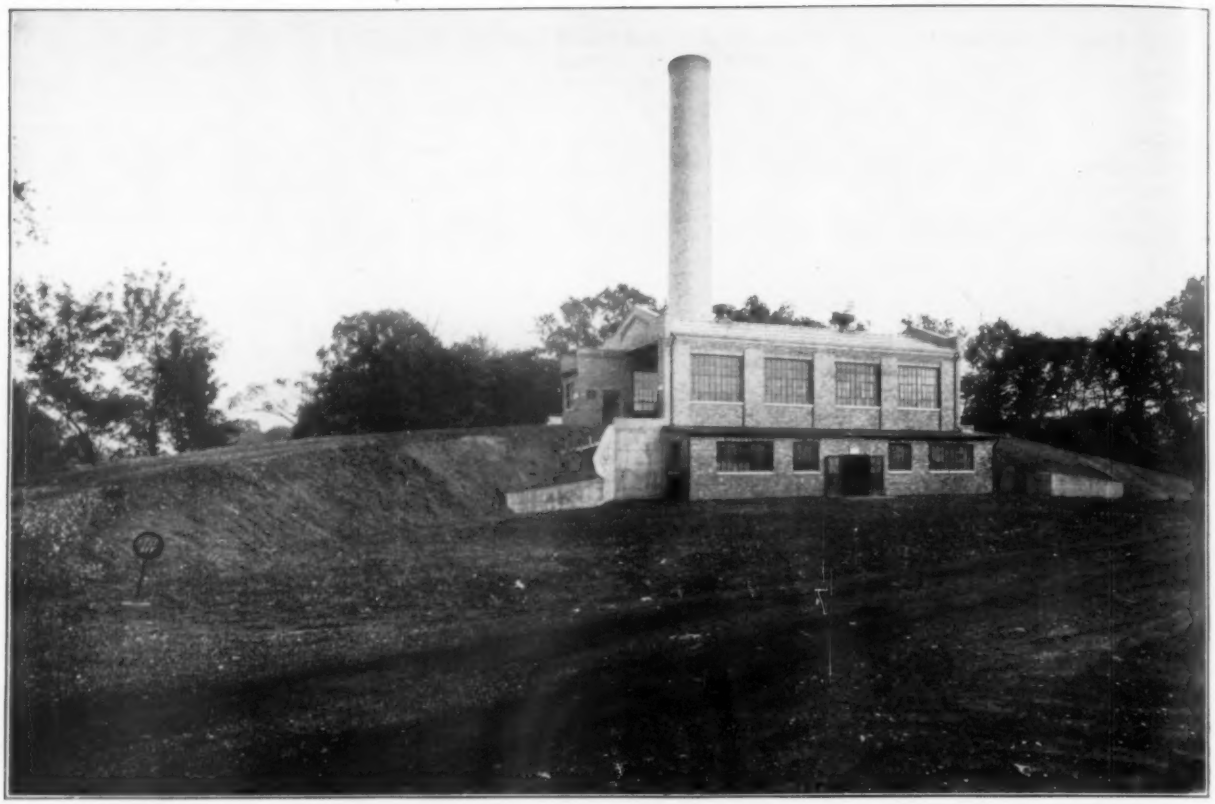
The trial judge ruled that, upon the facts found, the adoption of the zoning ordinance does not entirely change the neighborhood so as to impress the character of an industrial district upon it and take away wholly its character as a residential district; that the adoption of the ordinance does not act as a license in such a manner that what the defendant is doing cannot be considered a nuisance; but, although a nuisance, because of its importance, the difficulty of locating it in the permitted area so that it would not be a nuisance, and the probably increasing industrialization of the district, injunctive relief would not be granted. In this the trial judge was right. If an industry is not excluded from a district, it may, so far as the zoning ordinance is concerned, be located therein, but such ordinance is not a license or legislative sanction to carry on in the district every kind of business not expressly excluded therefrom; and if there are reasons apart from the zoning law why the business may not with impunity be carried on in the district, the zoning law, in the case at bar, furnishes no such protection to it.

Esthetic Zoning Established in Charleston, S. C.

The city of Charleston has passed a zoning ordinance in which it has created a district called "Old and Historic Charleston District." In this district structures can be erected only upon the approval of their exterior architectural appropriateness to the district by a Board of Architectural Review. This is an exercise of the police power for an esthetic purpose. The courts have sanctioned zoning in which esthetic control was incidental, but in no case have they expressly sustained a use of the police power where esthetics was the main purpose of the regulation, although there are many decisions tending to show a growing regard for this important element in our well-being.

Air Law

The planning of airports and the land in their neighborhood gives rise to so many perplexing questions of law that city planners will be interested to know of the formation of the American Academy of Air Law, located at Washington Square, New York, of which Alison Reppy, Professor at New York University Law School, is President and Executive Director, and Professors Forbes and Tooke, of that School, as well as the editor of these notes, are members of the Advisory Council.



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Here's a modern, dignified disposal plant put in service the past summer at Fort Wayne, Indiana—a progressive city typical of our great Central States. It has a rated capacity of 150 tons every 24 hours—sufficient to care for a normal population growth in future years. Fort Wayne replaced hog-feeding by high temperature incineration.

Complete scientific destruction of municipal refuse is today a necessity for the modern, growing American city. The sturdy construction and pleasing topographical layout of this "Pittsburgh-Des Moines" plant make it a distinct community asset. The wide sweeping, circular driveway provides convenient access and exit for collection trucks and permits direct charging of refuse to the furnaces.

The "Pittsburgh-Des Moines" incinerator is "foolproof"—it is economical—and it operates without smoke or offensive odors, and hence, without "comebacks."

View at left shows the interior of the stoking room for a 200-ton plant at Yonkers, N. Y. Each unit has a main and two auxiliary stoking doors and three ash-removal doors at the bottom.

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Finger Prints

Single Finger Prints—A New and Practical Method of Classifying and Filing Single Finger Prints and Fragmentary Impressions.—By Harry Battley, Chief Inspector in Charge of the Finger Print Bureau, New Scotland Yard, London, England. Published for the Bureau of Social Hygiene, Inc., by the Yale University Press, New Haven, Conn. 1931. 98 *pp.* $2.50 *from* THE AMERICAN CITY.

In this illustrated volume, Chief Inspector Battley outlines the system which he has devised of classifying single finger impressions separately in such a way that they can be readily produced for comparison with single marks found at scenes of crime. Tests and practical applications at Scotland Yard of all the various systems of single finger print classification known have shown that the Battley system yields by far the best results. Believing that American police departments would profit from the knowledge of the system in use at Scotland Yard, the Bureau of Social Hygiene has cooperated with the Yale University Press in bringing out this American edition of the book.

Housing

Recent Trends in American Housing.—By Edith Elmer Wood, Ph.D. Macmillan Co., New York. 1931. 317 *pp.* $3.00 *from* THE AMERICAN CITY.

This new book, by the author of "The Housing of the Unskilled Wage Earner," "Housing Progress in Western Europe," etc., offers much that is important both of urge and of aid to all who hope for—and are willing to work for—the betterment of housing conditions in American cities. In several passages Dr. Wood portrays in moving language the evils of the slum and the social importance of decent, adequate housing for our lower-income groups. But most of the book is no mere exhortation, it is based on cool, critical, historical and statistical analyses of the little that has been accomplished and the much that ought to be done in slum clearance and in large-scale, low-cost housing projects.

Between the comprehensive 59-page introduction and the bibliography and index there are chapters on War Housing, The Housing Shortage, Rent Restriction, Tax Exemption, Tenement House and Housing Codes, Rapid Growth of Zoning, City and Regional Planning, The Land Question, Satellite Garden Cities and Other New Towns, The Advent of Cooperative Housing, Housing Loans at Low Interest, Eliminating Commercial Profit, Housing by Public Authorities, The New York State Board of Housing, and Slum Clearance.

THE AMERICAN CITY last month (page 94) had the privilege of publishing an abstract of Dr. Wood's concluding chapter. The present reviewer would join with the author in voicing an urgent wish that a Major Statesman may arise to make Housing on the Grand Scale the chief plank in his platform.

Town Planning

The three volumes of the Report of the Thirteenth International Housing and Town Planning Congress, held in Berlin in June, 1931, are now available. Each one is in three languages—English, French and German. Volume I (410 pp., illustrated) contains 32 papers submitted to the Congress, and Volume II (54 pp.) contains the general reports on these papers. Volume III (141 pp., illustrated), the latest to be issued, includes the proceedings of the Congress, at which the two main subjects of discussion were the abolition of slums and the traffic problem in relation to town and regional planning. Another recent publication of the International Federation for Housing and Town Planning is Bulletin No. 26 (September, 1931), which contains an illustrated report on "Housing by Railway Companies in Great Britain," the first of a series of similar reports. 44 pp. (Apply to the Organizing Secretary, International Federation for Housing and Town Planning, 25, Bedford Row, London, W. C. 1, England.)

Vibration Control

Noise and Vibration Engineering.—By Stephen E. Slocum, Ph.D. D. Van Nostrand Co., New York. 1931. 180 *pp.* $2.75 *from* THE AMERICAN CITY.

Noise as an economic, social, and esthetic liability is claiming the attention of scientists in many fields. This practical study—surprisingly untechnical in nature—pioneers, at least in this country, in the field of vibration control as an engineering, industrial, commercial, and public works problem. The author gives his own experiments with vibration dampeners and insulations, and describes modern methods of deadening vibration in tall buildings. The insulation of machinery, and methods of acoustic correction are also described. Readers of THE AMERICAN CITY will find material of especial worth in the chapters on street traffic vibration and its control, and on subway vibration.

Incidentally, in presenting the economic aspects of noise and vibration, the author makes apparent the striking fact that adequate measures of control have yet to be established and that the prerequisite to their establishment is new and more effective legislation.

Law for Policemen

"A Manual of Criminal Law and Criminal Procedure for Police" (94 pp.) has been prepared by Ernst W. Puttkammer under the auspices of the Chicago Citizens' Police Committee, Northwestern University, and the University of Chicago. It is intended primarily as a textbook for police training schools, but is also useful as a ready reference manual for the policeman and is of interest to the ordinary citizen also. The contents are based upon Illinois law, but are considered to be widely applicable in other jurisdictions. $1.25. (Apply to University of Chicago Press, Chicago, Ill.)

Motor Transportation

A survey of the experience of "Municipal Motor Transportation" in Norfolk, Va., is presented in a 64-page mimeographed report prepared by Glen Leet, of the Office of the City Manager. Reasons are given as to why different types of motor equipment control were tried, records are discussed and compared, and recommendations are made. The definite placing of authority and responsibility is believed to be the greatest need in the field of municipal transportation in Norfolk. (Apply to the Office of the City Manager, Norfolk, Va.)

Self-Insurance

The International City Managers' Association is instituting a series of Studies in Municipal Management resulting from researches carried on by individual city managers with the aid of traveling fellowships made possible by the Spelman Fund. The present study, entitled "Municipal Self-Insurance of Workmen's Compensation," is the first to be published. It is by F. Robert Buechner, City Manager of Gladstone, Mich., and is particularly based on the experience of four small or medium-sized cities in Michigan and four in Virginia. Self-insurance was assumed to be practicable for large cities. The author presents his conclusions as to the smaller cities, as a result of his analyses. 72 pp. $1.50. (Apply to University of Chicago Press, Chicago, Ill.)

Filling Stations

"The Challenge of the Gasoline Filling Station ——Have Zoning Boards of Appeals Failed to Meet It?" was the subject of a paper presented by Paul A. Bankson, City Plan Engineer of New Rochelle, N. Y., at a recent meeting of the Westchester County Planning Federation, reporting a study which he made of filling stations in Westchester County (see page 77 of this issue.) Illustrated copies of the address are available. 14 pp. (Apply to Mr. Bankson, New Rochelle, N. Y.)

Unemployment

Widespread interest in methods of unemployment relief is evidenced by the mounting number of publications on the subject. Within the last month have appeared the following:

"*Municipal Problems in the Economic Depression*," published by the International City Managers' Association, 923 E. 60th St., Chicago, Ill. This mimeographed report of 91 pages reproduces part of the proceedings of the 18th annual conference of the International City Managers' Association, held in Louisville, Ky., in October. The papers in Part I are on Unemployment Relief, those in Part II on Reducing Expenditures to Meet Diminishing Income. Appended are a list of organizations and the services they offer to municipalities on relief work, and a selected bibliography. (Apply to the Association.)

"*Repair and Modernizing Activities in Many Cities*" are summarized in a 4-page folder issued by the Civic Development Department of the Chamber of Commerce of the United States. (Apply to the Department, Washington, D. C.)

"*Unemployment Relief in Michigan Cities*" is Information Bulletin No. 7 of the Michigan Municipal League. It reports on the unemployment relief and welfare work of various Michigan cities. 39 pp. $1.00. (Apply to the League, Ann Arbor, Mich.)

"*The Problem of the Year—Unemployment Relief*" is a reprint from an article in *Minnesota Municipalities* for November prepared in anticipation of a conference of mayors and other municipal officials to discuss unemployment and poor relief. Brief items report the programs of a number of cities and villages. 18 pp. (Apply to the League of Minnesota Municipalities, Minneapolis, Minn.)

"*The Stabilization of Employment in Philadelphia through Long-Range Planning of Municipal Improvement Projects*," by Dr. William N. Loucks, Research Associate and Assistant Professor of Economics, Wharton School of Finance and Commerce, University of Pennsylvania, describes a plan which might be widely applied. XIX + 341 pp. (Apply to the Wharton School, University of Pennsylvania, Philadelphia, Pa.)

"*The Minnesota Unemployment Research Project*," by Russell A. Stevenson, Dean of the School of Business Administration and Director of the Employment Stabilization Research Institute, University of Minnesota, is the first publication of the Institute and describes the scope of the large-scale study made possible by the assistance of grants from three foundations. The three projects making up the whole will be "the study of the economic aspects of unemployment, the experiments in individual diagnosis and retraining, and the development of public employment agencies." 26 pp. (Apply to the University of Minnesota Press, Minneapolis, Minn.)

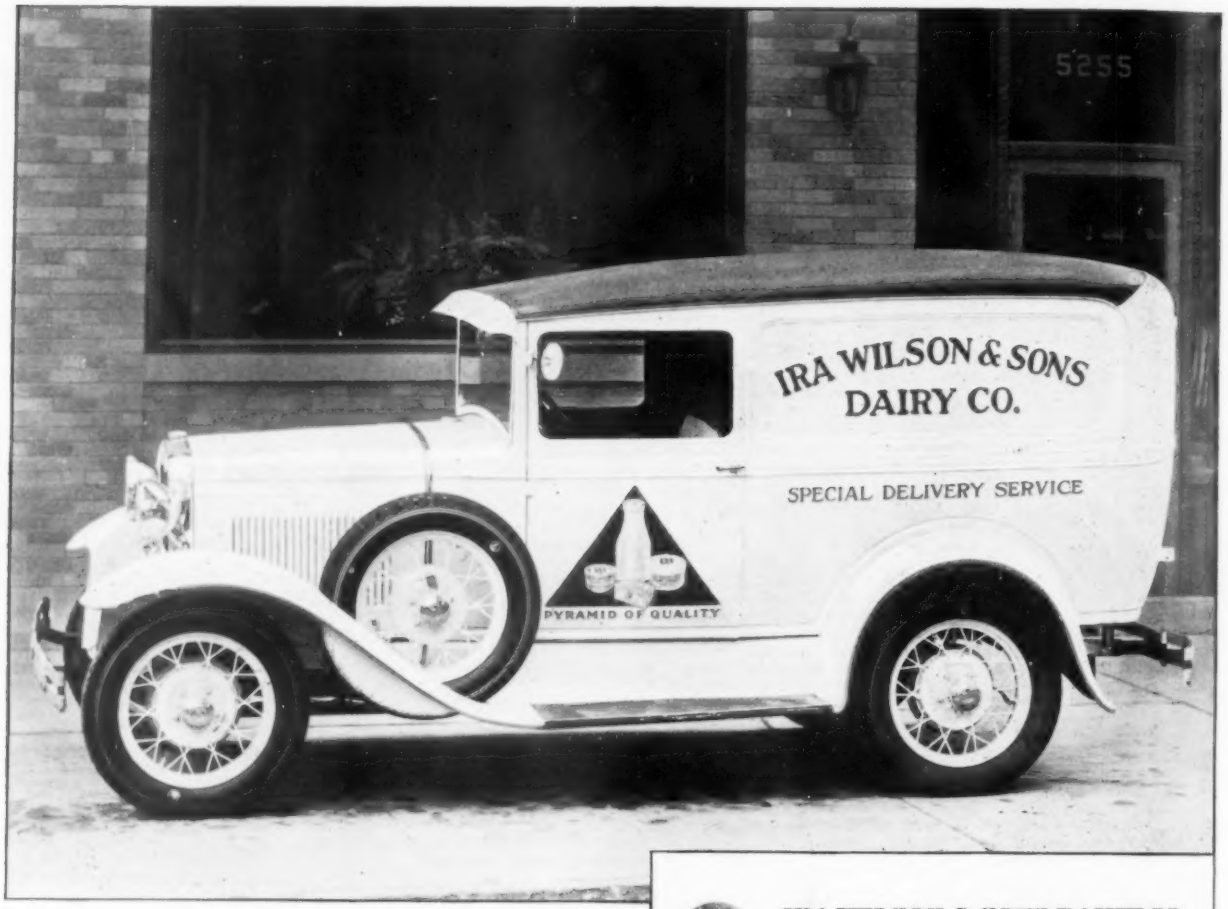
"*Unemployment Relief—A Selected Bibliography*" is the subject of the bi-monthly Library Bulletin (No. 109) of the Russell Sage Foundation. 4 pp. 10c. (Apply to the Foundation, 130 E. 22d St., New York.)

Community Trusts

Community Trusts in the United States and Canada—A Survey of Existing Community Trusts, with Suggestions for Organizing and Developing New Foundations.—Trust Division, American Bankers Association, New York. 1931. 68 *pp.* $2.00. (*Apply to the Association, New York.*)

This report has been published to meet the need for a handbook on the community trust, a comparatively new type of foundation, which has been defined as "a fund created by the union of many gifts held in trust, contributed and managed for the permanent benefit of the community." The report states that "the community trust idea was generated largely by the fact that over 20,000 charitable gifts in England and the United States had failed of their purpose and had been rendered useless because of the inability of the donors to foresee or provide against the future obsolescence of the objects of their generosity." A summary of a number of examples of the "dead hand" is given in an appendix.

BUILDING A BUSINESS



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Seventy-six Fords are now operated in our wholesale and retail business. They include trucks, light delivery cars, and salesmen's cars. Our deliveries are made on time. Our transportation costs are unusually low for the creamery industry. Maintenance expenses are exceedingly low. We believe that the handsome appearance of our Fords has real advertising value.

Many creameries are asking us how we keep our transportation costs so low. We tell them all there is no secret. We merely choose the best equipment — Fords.

Sincerely yours,

IRA WILSON & SONS DAIRY CO.

C. L. Wilson

CLW/B

C. L. Wilson
President

A Mayor's Record

Gaynor.—By Louis Heaton Pink. The International Press, New York. 1931. 256 *pp.* $2.75 *from* THE AMERICAN CITY.

Lawyer, judge, philosopher and fighter, William J. Gaynor was a unique mayor of New York City. His personality and independence left a vivid tradition following his death in 1913 at the close of his mayoralty. As the subtitle of this book states, he was known as "The Tammany Mayor who swallowed the Tiger." Mr. Pink, from personal knowledge and research, portrays the life of this extraordinary man, not omitting his faults—an ungovernable temper, a sometimes unbridled pen and tongue, a tendency to vacillate at times, being prominent among them. Gaynor brought many improvements to New York's government; above all, he represented a flaming ideal of honest, efficient government for the public welfare. Mr. Pink cites frequent instances of the bits of philospohy, homespun or from the masters, with which Gaynor illumined his writings while Judge and Mayor, and which served to ease a stormy career.

Physical Education

The Administration of Physical Education.—By Jay B. Nash. A. S. Barnes and Co. 1931. 491 *pp.* $4.00 *from* THE AMERICAN CITY.

There appear to be two major themes in the mind of Professor Nash. The first of these concerns the place of physical education in the whole scheme of education; the second, the practical setup, organization and administration of the program.

Physical education is an integral part of general education. Education is a process (activity) and a product (behavior changes). Viewing human life from the standpoint of four levels: the organic, the neuro-muscular, the interpretive-cortical and the emotional-impulsive, then, "no phase of education can deal merely with one level. Activity on one level affects other levels." Physical education contributes not merely to the acquisition of physical powers (organic), it likewise aids the individual in the coordination of the motor mechanisms of behavior (neuro-muscular) as expressed in terms of skill, poise and rhythm of action. Further, it enables the individual, up to the limit of his capacities, to accumulate meanings (interpretive-cortical) through activities. Finally, physical education, properly directed, lays the foundation for "legitimate thrills" (emotional-impulsive).

No one can legitimately take issue with Professor Nash in regarding the individual as an organic whole and in considering physical education with its concomitant, health, as contributing to life development, however one may choose to divide the levels of that development and in what order to place them. Furthermore, one can well pardon the author, who is Chairman of the Department of Physical Education and Health, School of Education, New York University, for making such enthusiastic statements as: "Physical education activities have contributed to interpretive education even more than arithmetic, algebra, Latin, history and geography."

In view of the increasing emphasis on physical education in the public school curriculum, the discussion of the organization and routine administration of the program is particularly timely. Workers in the field will find the author's analysis of these practical problems extremely helpful.

ANDREW G. TRUXAL,
Dartmouth College.

License Taxes

The Municipal Reference Bureau of the League of Virginia Municipalities has prepared three mimeographed reports on various types of license taxes which are imposed by municipalities in the state. "License Taxes on Amusements in Virginia Municipalities," Report No. 65 (35 pp.), divides the data for each city into three classes: Miscellaneous Amusements; Circuses and Shows; and Theaters. "License Taxes on Hawkers, Peddlers and Itinerant Merchants in Virginia Municipalities," Report No. 66 (20 pp.), also contains a discussion of the legal aspects of licensing peddlers. "License Taxes on Abattoirs and Butchers in Virginia Municipalities," Report No. 70 (4 pp.), merely lists the municipalities, the basis and the amount of licenses. (Apply to the League, Travelers Bldg., Richmond, Va.)

Better Homes

The Better Homes Manual.—Edited by Blanche Halbert, Research Director, Better Homes in America. 1931. 781 *pp. University of Chicago Press, Chicago,* Ill. $3.00 from THE AMERICAN CITY.

Practically every such question that could arise, from "How much can one afford to pay for a home?" to "What kind of kitchen utensils should be provided?", is discussed in "The Better Homes Manual," a symposium of statements by experts on practically every phase of home building and home furnishing. Attention is also given to such fundamental considerations as housing standards and how to improve housing conditions through city planning, zoning and legislation. The book is published by the University of Chicago Press in cooperation with Better Homes in America. Miss Halbert as editor has assembled a comprehensive selection of excerpts from authoritative books, articles and other available literature. A number of illustrations are included, and there is a selected list of references at the end of each chapter. One section outlines the scope of organizations engaged in housing and home improvement work. The manual can be used as a textbook, but it fills a much wider purpose by serving as a reference book of valuable information for home-owners and home-makers generally.

Building Lines

A discussion of the "Theory and Practice in Building Lines Under Eminent Domain" by Herbert S. Swan, City Planner, New York, has been published as a 12-page supplement to the *National Municipal Review* for September, 1931 (Vol. XX, No. 9). Nine conclusions are drawn, chiefly from the experience of Connecticut cities, which "have, in general, probably had about as much, as long and as favorable experience with building lines as any in the entire country." Apply to the League, 261 Broadway, New York.)

County Plan

"The Mercer County (New Jersey) Plan—A Guide for Future Development," prepared by the County Planning Commission, with Russell Van Nest Black, Consultant, is presented in an attractively illustrated brochure. Besides the recommendations for parks, highways, transportation facilities, etc., the Plan includes a valuable supplement containing a discussion of "General County Planning Progress and Experience Elsewhere in the United States" and "Legal Planning Powers of County and Local Governments in New Jersey." 110 pp. and a number of maps. (Apply to Mr. Black, 502 Otis Bldg., Philadelphia, Pa.)

Standards

The "A.S.T.M. Tentative Standards—1931" is a 1,008-page volume containing the American Society for Testing Materials "180 tentative specifications, methods of test, definitions of terms and recommended practices in effect at the time of its publication." Criticisms of the tentative standards are solicited and will be considered before the standards are finally adopted by the Society. Paper and cloth-bound copies are respectively $7.00 and $8.00 to non-members of the Society, and $4.50 and $5.50 to members. (Apply to the Society, 1315 Spruce St., Philadelphia, Pa.)

Civil Aeronautics

The Aeronautics Branch of the U. S. Department of Commerce has just issued Aeronautics Bulletin No. 1, "Civil Aeronautics in the United States," a complete revision of the publication with the same title previously issued. Part I discusses the development of civil aeronautics in this country ("aeronautics" being defined as "the science and art pertaining to the flight of aircraft"), including its growing importance as a transportation system and a manufacturing industry. Part II describes the functions and organization of the Aeronautics Branch of the Department of Commerce. 56 pp. (Apply to the Aeronautics Branch, Dept. of Commerce, Washington, D. C.)

Housing

Housing Policy in Europe—Cheap Home Building.—Published in the United Kingdom for the International Labour Office (League of Nations) by P. S. King & Son, Ltd., Orchard House, 14 Great Smith Street, Westminister, London, S. W. 1, England. Available in the United States only through the World Peace Foundation, 40 Mt. Vernon Street, Boston, Mass. Studies and Reports, Series G (Housing and Welfare), No. 3. XII + 378 *pp.* $1.25.

This volume has been published in carrying out a decision of the Governing Body of the International Labour Office to undertake a fresh investigation of the housing problem in the light of present-day developments. It covers only certain European countries—Great Britain, Netherlands, Sweden, Denmark, Norway, Italy, France, Belgium, Czechoslovakia, Finland, Austria, Poland, and Germany, eliminating others because of inadequate material or on account of difficulties of comparison and presentation. In each case, the study is given under divisions approximately as follows: Post-War Building Difficulties; The Extent of the Need; Public Authorities and the Financing of Building (Government Assistance; Assistance of the Local Authorities); Other Forms of Assistance (Exemptions from Taxation; Land Policy; Reduction of Building Costs and Rationalization); Bodies Initiating Building Work; The Dwellings Built.

Purchasing Laws

The second of a series of three pamphlets being published by the National Association of Purchasing Agents on the subject of centralized buying in government is "Purchasing Laws for State, County, and City Governments," by Russell Forbes, Secretary, National Municipal League, and Associate Professor of Government, New York University. In this pocket-sized pamphlet Dr. Forbes presents suggested laws and ordinances which may be adapted to fit local conditions. 32 pp. (Apply to the Association, 11 Park Pl., New York.)

The Roeblings

Hamilton Schuyler's biography of "The Roeblings—A Century of Engineers, Bridge Builders, and Industrialists" is the story of three generations of an illustrious family, most famous for building the Brooklyn Bridge and the George Washington Bridge over the Hudson River, and for their huge wire-making plants in Trenton and Roebling, N. J. 1931. 425 pp. $5.00 from THE AMERICAN CITY.

Regional Planning

In a booklet entitled "Regional Planning in Monroe County, New York," the Monroe County Regional Planning Board has reprinted a series of 21 short articles on the history and general practice of planning as applied to regions, and particularly on planning as it is being applied to Monroe County by the Monroe County Regional Planning Board. These articles were published originally in the Rochester *Democrat and Chronicle.* 24 pp. (Apply to the Board, Rochester, N. Y.)

Aerial Maps

At a meeting of the Visual Instruction Section of the Central Western District Meeting of the New York State Teachers Association held recently in Rochester, N. Y., J. Franklin Bonner discussed "Aerial Maps as Aids in the Teaching of Geography." This discussion has been mimeographed by the Monroe County Regional Planning Board and made available for distribution in the form of an illustrated booklet. Several aerial maps are reproduced, including one large one of Rochester as a whole. 14 pp. (Apply to the Regional Planning Board, 410 Terminal Bldg., Rochester, N. Y.)

Road Construction

"Road-Mix Types," Manual Number One of the Asphalt Road Construction Series of The Asphalt Institute, is an illustrated pocket-sized pamphlet discussing methods of mechanically mixing mineral aggregate and bitumen directly on the road-bed or road base. 59 pp. (Apply to The Asphalt Institute, 801 Second Ave., New York.)

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Prison Labor

Should Prisoners Work?—A Study of the Prison Labor Problem in the United States.—By Louis N. Robinson, Ph.D., member of the Advisory Committee on Penal Institutions, Probation and Parole, of the National Commission on Law Observance and Enforcement.—The John C. Winston Co., Philadelphia. 1931. XII + 353 *pp.* 28 *tables.* $2.50 *from* THE AMERICAN CITY.

The question expressed in the title of this book is answered affirmatively in the first chapter: The author then investigates from authoritative sources the actual conditions, and concludes that, taking the country as a whole, at least 75 per cent of all prisoners in institutions for misdemeanants are idle, stating that to such (short-term) institutions are sent 86.8 per cent of all convicted prisoners. Poor management and the competition of prison-made goods with those produced by free labor are stated as the two main reasons for the unemployment of prisoners. The several systems of employing prisoners are described, showing the state-managed system to offer better opportunity for the control and training of the prisoner. The problems of management are treated concretely; the costs, wages and profits of prison labor are studied; and the kinds of work that are actually being done by prisoners are presented, including road work in the southern states. It is well for us to consider this condemnatory statement in the closing chapter: "But the most potent *underlying* cause of unemployment in prisons of every kind is the absence of any settled public opinion in favor of adequate work—any definite popular support such as sane prison labor policies enjoy in Europe. . . . The man in the street . . . is the person responsible for the lack of work which he deprecates."

City Finances

"The Present Financial Status of 135 Cities in the United States and Canada" is examined by Frederick L. Bird in Statistical Series Publication No. 5 of the Municipal Administration Service, which is compiled from information supplied by finance officials or bureaus of governmental research in 135 of the 326 cities of over 30,000 population in the two countries. The report is divided into three sections,—I, Assessed Valuations, Tax Rates, and Delinquent Taxes; II, Revenues, Expenditures and Budgets; and III, Special Action to Curtail Expenditures,—each with a table giving figures for three or four years. 19 pp. 25c. (Apply to the Municipal Administration Service, 261 Broadway, New York.)

Taxpayers' Monthly

The enterprising Taxpayers League in Teaneck, N. J., a township of some 16,500 in Bergen County, is publishing an illustrated monthly paper, *The Town Manager*, to inform citizens of the progress of their local government. The items are newsworthy and concise, and the number of advertisements indicate that the project ought to pay its way. 16 pp. 5c. (Apply to the Teaneck Taxpayers League, Teaneck, N. J.)

Washington Bicentennial

Communities participating in the celebrations in honor of the 200th anniversary of the birth of George Washington next year will be interested in the pageant-play, "In the Hearts of his Countrymen," written by Marion Holbrook especially for school use. The play is published in a 19-page pamphlet by the Community Drama Service of the National Recreation Association. (Apply to the Drama Service, 315 Fourth Ave., New York.)

Financial Administration

"Municipal and County Financial Administration" is the subject of Report No. 3 of the New Jersey Legislature's Commission to Investigate County and Municipal Taxation and Expenditures. Based on data obtained from the annual audit reports of New Jersey counties and municipalities, the report surveys the defects which have appeared in the original financial administration legislation which was adopted fifteen years ago, and "outlines a constructive program of revision, with particular emphasis upon measures of expenditure control, a feature which was lacking in the earlier legislation." 128 pp. (Apply to the Commission, Trenton, N. J.)

Public Health

Communicable Disease Control: Report of the Committee on Communicable Disease Control of the White House Conference on Child Health and Protection; George H. Bigelow, M.D., Chairman.—The Century Co., New York. 1931. XV + 243 *pp.* $2.25 *from* THE AMERICAN CITY.

The health officer needs a cooperative public in order to work successfully for the control of communicable disease. This report reviews the ways in which control is now practiced and recommends general and specific measures that should be taken for the individual diseases. Fields for future study are presented, and the volume gives its message to those responsible for disease control, with the understanding that they are the ones to explain to the public the ways of cooperation. The general public may listen to the call when it is impressed upon them that children are the patients in one-half of the 3,000,000 cases of communicable disease reported every year in this country. Many tables are given, presenting Federal census figures for death among children for 1926-7-8; cases by age groups in Kansas, Massachusetts, and New York in the same years; morbidity rates for 1919-28; seasonal prevalence; and mortality. The dependable information on recommended procedures can be read with profit even by the layman.

Federal Services

A bulletin of 100 pages is needed to describe in condensed form the extent and variety of the "Federal Services to Municipal Governments," compiled for the Municipal Administration Service by Paul V. Betters, staff member of the Institute for Government Research of the Brookings Institution. Publication No. 24 of the Municipal Administration Service is an authoritative study of the various types of aid and assistance—many of them not widely known or appreciated—which the United States Government extends to municipal governments. In the body of the report the services are described according to Federal organization units, while in the summary and index they are taken up under functional headings. 50c. (Apply to the Municipal Administration Service, 261 Broadway, New York.)

Zoning

Zoning administration in a number of cities in Pennsylvania is reported briefly in a paper on "Does Zoning Retard Building Operations?" by Francis J. Mulvihill, Chief of the Division of City Planning and Municipal Engineering, Bureau of Municipal Affairs, Pennsylvania Department of Internal Affairs. The paper is reprinted from the Official Proceedings of the 36th Annual Convention of the American Society of Municipal Engineers, held at Richmond in October. Mr. Mulvihill reaches the conclusions that "in Pennsylvania evidence points to the conclusion that zoning affects the total building operations, if to any extent, very little over a period of years." 14 pp. 10c. (Apply to Mr. Mulvihill, 1400 N. Second St., Harrisburg, Pa.)

Paving Study

"Pavement and Street Improvement Costs" is the title of an 8-page reprint from *The Tax Digest* for September, 1931, compiled and published by the California Taxpayers' Association. Several tables are included showing comparative costs of different types of pavement, Table 4 showing the low bids on patented and unpatented street improvement jobs in a number of California cities. 15c. (Apply to the Association, 775 Subway Terminal Bldg., Los Angeles, Calif.)

Street Trees

An attractive folder, illustrated with green-tinted photographs, is published by the Division of Forestry of the Department of Parks, Los Angeles, Calif., to present the dollars-and-cents reasons as well as the esthetic arguments in favor of planting street trees, under the title "The Way to Rising Property Values Is Lined with Trees." Los Angeles, 20 per cent planted, is compared with other cities, and the Park Department's program is explained. 16 pp. (Apply to the Division of Forestry, Dept. of Parks, Los Angeles, Calif.)

City Sociology

The Sociology of City Life.—By Niles Carpenter, Chairman of the Department of Sociology and Anthropology, The University of Buffalo. Longmans, Green and Co., New York. 1931. XIX + 502 *pp. Charts, tables.* $3.90 *from* THE AMERICAN CITY.

Permanent communities came into being in the later stone age and from that time there was a steady development to the city, as shown in Western Europe's archeological records. The interesting story of the rise of the urban type of society as told in this volume leads to a study of city location, the reasons for choice of site, and the causes of the resulting development—economic, political and cultural. How the structure of the city grew in relation to its location and topography, and how later the city modified its site and consciously planned its layout to meet the transportation needs of its expanding area, is made clear. The development of differently functioning areas within the city is of absorbing interest, as is also the discussion of the relation between cities and the "rural residue." The chapter on city and regional planning summarizes analytically the guiding of urban growth and calls attention to new possibilities of limiting city expansion. Naturally, the most stirring chapters of the book deal with the city's influence upon personality—a study of home, work, worship, and recreation, of poverty, crime, vice, and mental deficiency and disease. Poverty in the city is compared with poverty in the country. The supply services of the city, its housekeeping facilities as functioning in waste disposal, and the value of inter-regional cooperation, are presented. Public utilities and public services are discussed in relation to their economic, political and administrative aspects. City government is not passed by, but the city is understood to be primarily an administrative rather than a political unit. The "short-run future" of the city, and the "long-run outcome" of city life are the subjects of the closing chapter, and "An Historical Postscript" gives an analysis of Rome's decline to a rural society.

Traffic Counts

The University of Wisconsin has published in a bulletin entitled "A Method of Making Short Traffic Counts and Estimating Traffic Circulation in Urban Areas," the results of the six years of research of the Barney Link Fellowship at the University. The authors are Franz A. Aust, Associate Professor of Landscape Design, and H. F. Janda, Professor of Highway Engineering and City Planning, assisted by John R. Campbell and Robert S. Harrison, Barney Link Research Fellows in 1924-1928 and 1929-1930 respectively. The Fellowship was established by the Outdoor Advertising Association of America "to study problems in advertising, marketing, circulation, and landscaping in connection with advertising." 62 pp. (Apply to the University, Madison, Wis.)

I. A. P. W. O.

A verbatim account of the three-day sessions of the Twelfth Annual Conference of the International Association of Public Works Officials, held in New York in September, 1931, is contained in the illustrated "Report of Proceedings." The training of public officials, sewage disposal, city planning, snow removal, public works, street cleaning, street lighting, airports, street sanitation records, and taxation, were discussed. 76 pp. (Apply to A. M. Anderson, Sec., I. A. P. W. O., 100 N. LaSalle St., Chicago, Ill.)

Other Reports Received

ALBANY, N. Y.—Annual Report, Albany Port District Commission, year ending June 30, 1931. 71 pp.

BERKELEY, CALIF.—Annual Report of the City Manager, year ending June 30, 1931. 83 pp.

CHICAGO, ILL.—Annual Report, Department of Public Works, 1930. 381 pp.

MARSHALL, MO.—Annual Report, Board of Public Works, 1930. 34 pp.

WAKEFIELD, MICH.—Annual Report—General Budget and Emergency Budget, 1931. 22 pp.

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CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local.)

DECEMBER 2-5.—WASHINGTON, D. C.
President's Conference on Home Building and Home Ownership. Executive Secretary, Dr. John M. Gries, Department of Commerce, Washington, D. C.

DECEMBER 3-4.—NEW SMYRNA, FLA. (350)
Florida League of Municipalities. Semi-annual meeting. Secretary-Treasurer, E. P. Owen, 1201 Lynch Building, Jacksonville, Fla.

DECEMBER 4-5.—HOUSTON, TEXAS. (100)
Texas City Attorney's Association. Annual convention. Executive Secretary, Harvey W. Draper, 319 Kress Building, Houston, Texas.

DECEMBER 8-9.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual congress. Secretary-Treasurer, S. A. Thompson, 824 Colorado Building, Washington, D. C.

DECEMBER 10-11.—WASHINGTON, D. C.
Highway Research Board of the National Research Council. Annual meeting. Director, Roy W. Crum, B and 21st Streets, Washington, D. C.

DECEMBER 10.—HELENA, MONT. (25)
Montana Association of Commercial Organization Secretaries. Annual convention. Secretary, R. C. Bricker, Box 1767, Great Falls, Mont.

DECEMBER 28-30.—WASHINGTON, D. C. (400)
National Community Center Association. Annual meeting. Secretary, LeRoy E. Bowman, Hudson View Gardens, Pinehurst Avenue, New York.

JANUARY 1.—NEW YORK.
National Health Council. Annual meeting. Executive Officer, Dr. Thomas C. Edwards, 370 Seventh Avenue, New York.

JANUARY 9-15.—DETROIT, MICH. (25,000)
American Road Builders' Association, including the following divisions: City Officials', County Highway Officials', Manufacturers' and Pan-American. Annual convention and Road Show. Secretary and Engineer-Executive, Charles M. Upham, National Press Building, Washington, D. C.

JANUARY 15-17.—WASHINGTON, D. C. (100)
American Engineering Council. Annual meeting. Executive Secretary, L. W. Wallace, 744 Jackson Place, Washington, D. C.

JANUARY 18-21.—MILWAUKEE, WIS. (500)
Associated General Contractors of America, Inc. Annual convention. Managing Director, E. J. Harding, 222 Munsey Building, Washington, D. C.

JANUARY 18-21.—MINERAL WELLS, TEXAS. (300)
Texas Water Works Short School. Annual session. Address: V. M. Ehlers, Secretary, S. W. W. A.—Texas Section, Austin, Texas.

JANUARY 20-22.—NEW YORK. (800)
American Society of Civil Engineers. Annual meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

JANUARY 21.—LEWISTON, IDAHO. (100)
Idaho State Chamber of Commerce. Annual meeting. Secretary, L. F. Parsons, 529 Idaho Building, Boise, Idaho.

JANUARY 22-23.—NEW YORK. (200)
American Social Hygiene Association. Annual meeting. General Director, Dr. William F. Snow, 370 Seventh Ave., New York.

JANUARY 25-29.—MILWAUKEE, WIS.
American Institute of Electrical Engineers. Annual winter convention. National Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

JANUARY 25-28.—CLEVELAND, OHIO. (1,000)
American Society of Heating and Ventilating Engineers. Annual meeting. Secretary, A. V. Hutchinson, 51 Madison Avenue, New York.

JANUARY 25-27.—PHILADELPHIA, PA. (100)
American Society of Landscape Architects, Inc. Annual meeting. Executive Secretary, Bradford Williams, 9 Park Street, Boston, Mass.

JANUARY 25-29.—LAFAYETTE, IND. (600)
Purdue Road School. Annual school. Address: Professor Ben H. Petty, Engineering Extension Department, Purdue University, Lafayette, Ind.

JANUARY 27-29.—PEORIA, ILL. (150)
Illinois Society of Engineers. Annual meeting. Secretary-Treasurer, Winfred D. Gerber, 1001 West Oregon Street, Urbana, Ill.

JANUARY 28.—BOSTON, MASS.
Massachusetts Association of Boards of Health. Annual meeting. Secretary, George T. Lennon, Department of Health, Haverhill, Mass.

FEBRUARY 3-5.—TORONTO, ONT. (250)
Engineering Institute of Canada. Annual meeting. Secretary, R. J. Durley, 2050 Mansfield Street, Montreal, Que.

FEBRUARY 10-12.—CHICAGO, ILL. (100)
National Paving Brick Association. Annual meeting. Chief Engineer and Managing Director, G. F. Schlesinger, 1245 National Press Building, Washington, D. C.

FEBRUARY 10-13.—CHICAGO, ILL. (350)
National School Supply Association. Annual convention. Executive Secretary, J. W. McClinton, 176 West Adams Street, Chicago, Ill.

FEBRUARY 16-18.—ANN ARBOR, MICH. (600)
Conference on Highway Engineering—University of Michigan. Annual convention. Secretary, R. E. Morrison, University of Michigan, Ann Arbor, Mich.

FEBRUARY 17-19.—ATLANTIC CITY, N. J. (2,000)
Association of Highway Officials of North Atlantic States. Annual convention. Secretary-Treasurer, A. Lee Grover, State Highway Commission of New Jersey, Trenton, N. J.

FEBRUARY 19-25.—WASHINGTON, D. C. (10,000)
National Education Association—Department of Superintendence. Annual meeting. Executive Secretary, Sherwood D. Shankland, 1201 16th Street, N. W., Washington, D. C.

FEBRUARY 23-26.—WICHITA, KANS.
Southwest Road Show and School. Manager, F. G. Wieland, Exposition Building, Water and Williams Streets, Wichita, Kans.

MARCH 1-4.—WASHINGTON, D. C. (800)
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 641 New Center Building, Detroit, Mich.

MAY 2-6.—MEMPHIS, TENN. (1,500)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

MAY 9-12.—ATLANTIC CITY, N. J. (500)
National Fire Protection Association. Annual meeting. Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

MAY 23, WEEK OF.—LONDON, ENGLAND.
International Congress of Local Authorities. (Followed by tours in England and Scotland during the next two weeks.) General Secretary, E. Vinck, Rue de la Régence, Brussels, Belgium; General Secretary of the British Organization, G. Montagu Harris, Ministry of Health; Whitehall, London, S. W. 1. American inquiries may be addressed to Luther Gulick, Director, National Institute of Public Administration, 261 Broadway, New York.

MAY 25-27.—MENASHA, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

MAY 26-28.—PHILADELPHIA, PA. (250)
Pennsylvania State Association of Township Commissioners. Annual convention. Secretary-Treasurer, M. B. Black, Annville, Pa.

JUNE.—LOS ANGELES, CALIF.
National Conference on City Planning. Secretary, Flavel Shurtleff, 130 East 22d Street, New York.

JUNE 20-24.—CLEVELAND, OHIO. (550)
American Institute of Electrical Engineers. Annual summer convention. National Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

JULY 23-29.—LOS ANGELES, CALIF.
International Recreation Congress and annual meeting of the National Recreation Association. First International Congress. Administrative Secretary, Thomas E. Rivers, 315 Fourth Avenue, New York.

SEPTEMBER 28-30.—PITTSBURGH, PA. (150)
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

One of the interesting features of the Third Annual Conference of the Virginia Water and Sewage Works Association held at Lynchburg, Va., November 16 and 17, was the visit to the cast iron pipe plant of the Lynchburg Foundry Co., as shown in this photograph. The trip through the plant was conducted by Macon P. Miller, Personnel Director

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NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Progress in Dewatering Sewage Sludge

D. F. Irvin, Oliver United Filters, Inc., 33 West 42nd Street, New York, reports that two 8 x 12-foot Oliver continuous sludge filters, have been sold to the city Dearborn, Mich., for the dewatering of precipitated sludge there. Tests are now being conducted on Long Island with a small filter using the same general scheme of treatment. This small filter is doing excellent work at the present time.

The city of Shanghai, China, which uses activated sludge as a method of sewage disposal, has become interested in the dewatering of the sludge and has bought a small Oliver filter for this purpose. It is interesting to note that this purchase follows shortly after the placing in operation of two Oliver filters sold to the city of Nagoya in Japan, from which reports of successful work have been received.

Oliver United Filters, Inc., is conducting considerable demonstration work on sludge filtration of different types on both excess activated sludge and digested activated sludge in various Middle Western cities, and a lengthy period of such work with an Oliver continuous sludge filter at the plant of the city of Los Angeles, Calif. This last plant serves two important purposes, mainly the treatment of the sewage and the return of a highly purified effluent to the gravel beds which are the source of a part of the city's water supply, while the sludge produced after digestion is being filtered in contemplation of final disposal as plant food.

Other Oliver sewage sludge filtration installations continue to operate with success, and Mr. Irvin reports that sanitary engineers generally are more and more interested in the filtration method for final disposal of sludge as compared with sand-bed drying. It has been found that by the addition of suitable amounts of the necessary crude chemicals, that is, potash, phosphates, etc., all these sludges when filtered can be made into highly attractive combined fertilizer at a total cost which is less than the sale cost, and this is being carried on in the South Atlantic States as well as in California.

A New Bituminous Road Mixer

It is a well-known fact that a gravel road is better than an old dirt road, and it therefore follows that a gravel road properly bound with a bituminous product is a still better road than the loose, dusty gravel road. The Iowa Manufacturing Co., Cedar Rapids, Iowa, has recently developed a machine which will pick up gravel from a road, batch the material accurately, mix it thoroughly, and put it down as a hard-surfaced, dustless and low-cost road.

This Cedar Rapids road-mixer picks up the material from the road by means of a full floating elevator loading device mounted on caster wheels and controlled by the operator on the steering platform. The loader is equipped with adjustable wings for various widths of windrows and operates at 160 f.p.m. It makes a clean pick-up of all the loose material, which is brought to the center buckets by a ribbon feeder. When 200 pounds of aggregate, the maximum size for which is 2½ inches, has been delivered to the aggregate batcher by the elevator buckets, the batcher trips automatically, an action which operates the bitumen batcher, which has been previously set to deliver a predetermined amount of bitumen. Under normal operating conditions, this trips every five or six seconds. The oil batcher is of the single piston type and can be set to deliver from 0.7 to 2.2 gallons of oil per 200 pounds of aggregate. A pressure gage and integrating meter record the pressure on the batcher and the number of gallons that flow through it. It can be easily calibrated for various quantities.

The mixing is done in a thorough and accurate manner inside the pugmill, the main paddle shaft of which operates at 50 r.p.m and has 39 pairs of mixing blades. All parts are accessible, and all wearing parts can be quickly and easily renewed. The mixed material discharges from the rear end onto the ground or onto a conveyor for truck loading.

THE CEDAR RAPIDS BITUMINOUS ROAD MIXER

A 850-gallon bituminous storage tank is insulated so that under all normal operating conditions the oil temperature drop will not exceed 2 degrees an hour. This tank can be filled from a truck tank while the plant is moving along, and is equipped with a thermometer and a capacity gage. A set of coils provide quick heating facilities for the material in the tank. Heat is provided by a simple and reliable hand pressure type kerosene burner. Two burners are installed, to allow for the possible failure of one and to permit operations when the outside temperature is lower than is usually considered safe for road mix operations. According to the manufacturer, it takes less than 30 minutes to bring the bitumen from outside temperature up to near the boiling point in this tank.

All lever controls, including the steering controls, the raising and lowering controls on the front elevator, and the forward and reverse controls for the plant, are located on the control platform, and are banked for easy access to the operator. Power is provided by an 85-horsepower Climax Blue Streak engine mounted on one side of the mixer. Variable speeds are obtained through the specially constructed transmission. Electrical starting and lighting equipment can be furnished promptly on special order.

A New Self-Feeding Sand Spreader

Modern traffic conditions have for some time impressed street and highway officials with the growing need not only for efficient snow removal but also with the necessity for ample equipment and facilities for properly sanding icy and slippery roads. A new development in this field has recently been brought out by the Anderson Engineering Sales Co., Statler Building, Boston, Mass., and is known as the Anderson self-feeding sand spreader. It is built for all types of dump trucks and can be easily and quickly attached. The standard model attaches to any Ford or Chevrolet dump truck with dual pneumatic tires in less than five minutes, according to the manufacturer.

This spreader, which is simply and ruggedly constructed, replaces the tailgate of the truck and has a power drive by means of a V-bolt from the rear wheel. It is self-feeding and can be used with the truck body raised in any position, spreading any required amount of sand smoothly and evenly, at any required width. The amount of sand is regulated and the clutch handled by the operator from a convenient position or from the cab. This unit may be operated at any speed up to 30 or 40 miles an hour, and can spread under the rear wheels of truck.

BECAUSE OF THIS SPIRIT

THE biggest thing about your telephone is the spirit of the hundreds of thousands of people who make up the Bell System. No matter what their particular jobs may be, they are first of all telephone men and women.

The loyalty of these people to the ideals of their work is reflected in every phase of your telephone service. It shows in the increasing speed with which your local and long distance calls are completed. It shows in the greater accuracy with which they are handled. It shows in the wider and more convenient facilities which are placed at your command—extension telephones, intercommunicating systems for home and office, small and large switchboards, teletypewriters and many others.

Because of this spirit, your needs for fast, complete and inexpensive telephone service are more fully met each year. Men and women of the Bell System are constantly explaining the varied telephone services to more and more users. They prepare the way for the new plant and equipment put at your disposal every year. Through their efforts, you receive better and wider service at a cost made possible only by an organization of this character.

Although it does not appear on the balance sheet, the greatest asset of the Bell System lies in the skill, energy and purpose of the people who carry on its work. Every time you telephone, you get the advantage of this—in better and better service at the lowest possible cost.

★ *AMERICAN TELEPHONE AND TELEGRAPH COMPANY* ★

Do you mention THE AMERICAN CITY? Please do.

THE NEW AUSTIN BADGER SHOVEL

Curved Boom Features New Tractor Shovel

A new tractor-mounted shovel with a full three-quarter swing for the boom but with no tail swing, and having a curved boom which increases the loading height of the shovel, has been announced by the Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, Ill. This Austin Badger shovel is powered with a McCormick-Deering Model 20 industrial unit, and the tractor is regularly equipped with a transmission having a number of speeds forward and one reverse. The rear axle of the tractor is used as a jack shaft and by means of two heavy roller chains running over sprockets on the shaft to both sprockets on the crawls, the manufacturer has retained the power and the various speeds of the tractor for moving the shovel.

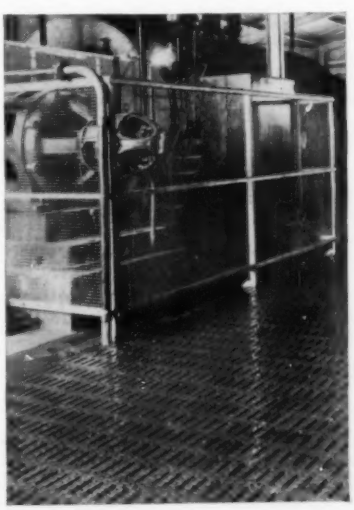
The upper end of the mast is anchored by an A-shaped truck frame reaching back to the extreme end of the main frame, which serves to utilize the entire weight of the unit as a counterbalance to the dipper load, and also equalizes the pressure on the pivot post bearing and trunnions. The boom is formed from two 12-inch channels shaped to give strength, and with the upper end curved to give greater clearance for the dipper handle. The dipper handle is 5 by 10 inches in size and is made up of two heavy section rectangular steel tubes to which are welded the crowd racks.

The dipper handle socket is a heavy steel casting pivoted on the bucket ribs. By means of the rake bars the bucket can be set in three positions to change the angle of the dipper on the dipper handle to suit various working conditions. The door of the 11-foot capacity bucket is one piece of steel plate with the hinge members, which are heavy steel forgings extending the full length and welded solidly in place, thus reinforcing it and keeping it from springing. The latch is a heavy steel bar, beveled on both ends so that it can be reversed when worn. It is released by the operator through a double lever trip. The teeth or rooter points are of manganese steel of the renewable and reversible type, held in the bases by keys.

The machinery table contains the working parts of the shovel and rests on the base with double the support found in ordinary construction. The center pivoted post is of large diameter and is fitted with a heavy bronze thrust washer and bushing to take both vertical and side loads. The weight of the entire units is carried on these thrust members in conjunction with four machined radial trunnions. The radial track on which these trunnions roll is part of the main base casting and is machined perfectly smooth and true. The circle swing gear is cast integral with the base unit, and the machinery table, which is also a heavy steel casting, is provided with a skirt which serves as a guard covering the base unit. Separate front and rear axles with rubber-tired wheels are used for quick moving of the shovel over the road when desired. The Austin Badger may be equipped for clamshell operation, as a backfiller, a trench hoe, a dragline, and a crane.

An Improved Non-Skid Floor Grating

Because of its design, the new slotted floor plate made by the Central Iron & Steel Co., Harrisburg, Pa., requires no deep recess or rabbet in which to set. The plates can be furnished in almost any gage and size up to 72 x 240 inches, thus eliminating the necessity for a complicated supporting structure such as would be required with smaller sections.

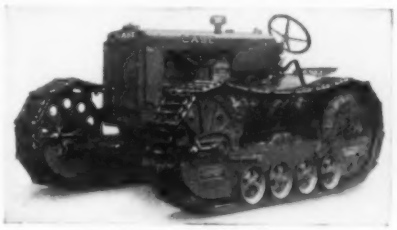


A FLOORING OF SLOTTED PLATES

In addition to being non-skid, this new slotted floor plate allows free ventilation, free drainage, passage of light, and reduced weight. It is recommended for use for fire escapes and exterior platforms, flooring and galleries in industrial and municipal plants where trapped fumes, gases or heat may produce a hazard, and many other places in and around municipal buildings.

Heavy-Duty Crawlers for the Case Tractor

A new heavy-duty crawler, known as the Trackson model GC, has been announced for the Case Industrial Tractor, by the Trackson Co., 1322 South First St., Milwaukee, Wis. Equipped with this positive traction, the Case tractor is adapted to a wider range of uses. The combination permits not only drawbar work, but equipment operation as well. The design of the crawlers provides for the in-building of either front, side or rear-end equipment, such as shovels,



THE NEW GC CASE-TRACKSON CRAWLER UNIT

loaders, bulldozers, hoists, cranes, etc., and all are readily interchangeable.

Correct operation of these attachments is assured by the balance and structural strength of the combination. The motor unit does not overbalance the front end, but is centered fore and aft between the crawlers. Extra-heavy crawler frames, truck wheels and bearings provide sufficient strength for the greater superimposed loads of equipment operation. Wide clearance between the crawlers and motor permits quick, secure attachment of the equipment and easy adjustment or lubrication of the crawler mechanism. The crawlers are of all-steel construction, with track shoes of heavy electric-alloy steel, cast in one piece, and specially corrugated to grip securely without damaging road surfaces.

Texas Company Adds Calcium Chloride to Its Road Products

The Texas Company, Asphalt Sales Department, 135 East 42nd Street, New York, has announced that on November 15 Texaco calcium chloride was added to the line of asphaltic street and highway products which it now markets. The road-building industry will be the principal market for Texaco calcium chloride. This material acts as an efficient dust-layer on gravel, macadam and similar surfaces, and is recommended for use in the curing of concrete.

STANDARD *Sure-Stop* TRAFFIC MARKER

REDUCED ACCIDENTS 65%

Says Wichita {Kans.} Official . . .

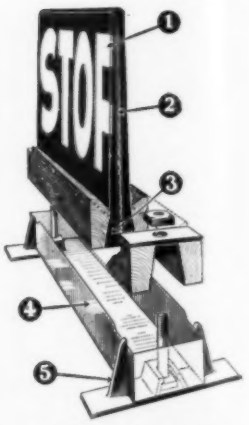
"After two years experience with your Rubber Traffic Signals we have this to say: Conservatively speaking they have decreased accidents at least sixty-five percent and we are using them in all parts of the city. They are a signal, regardless of weather, that can be seen for several blocks.

"My particular attention has been called several times to numerous accidents which have taken place at certain street intersections and immediately after placing these stop signals there our trouble has been eliminated . . . after two years of service our signals are still in fine condition. They are the best signals I have ever seen." *Official's name on request.*

* * *

In over 2,000 municipalities Standard Sure-Stop Traffic Markers have proved that they are the most effective and economical markers. No city can afford to be without them. For full particulars, see your local General Tire dealer, or write direct to

The General Tire & Rubber Co.
AKRON, OHIO



A flexible rubber panel 22 in. long standing upright in pavement, 7 in. high. Letters of Federal Yellow rubber vulcanized into black rubber background. Creosoted wood base with brass anchor plates enclosed in aluminum case.

1. Thick letters are inlaid — cannot wear off.
2. Fabric reinforcement insures upright position.
3. Wedge shaped base holds rubber slab firmly in place.
4. Aluminum case embedded permanently in pavement.
5. Brass anchor plate and bolt cannot rust; refilling is easy.

SIMPLE TO INSTALL

Simply cut slot in pavement 4 to 5 in. wide, without disturbing paving foundation. Insert marker and pour asphalt or concrete around it. To install refills, simply unscrew nut at ends of base and lift out old marker.

A 600-gallon Kinney Junior Distributor mounted on Model "AA" Ford chassis equipped with Twinflex extension as recently sold to the City of Erie, Pennsylvania.

Descriptive catalog with prices will be furnished on request.

THE

TRADE MARK *Kinney* REG. U.S. PAT. OFF.

JUNIOR

HEATER AND DISTRIBUTOR

A medium-sized, light-weight bituminous Distributor designed for securing greatest efficiency and economy in projects comprising the construction and maintenance of bituminous highways.

Tank capacities of 350 and 600 gallons, complete for mounting on light-weight motor chassis including the modern Ford model as shown in the illustration.

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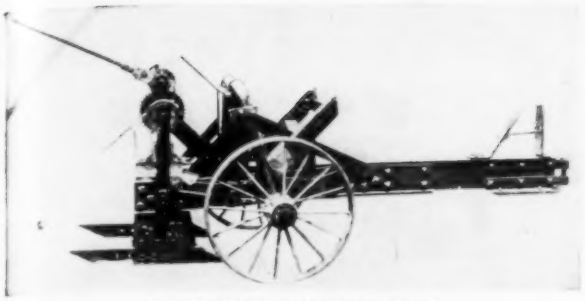


THE DUKELOW HARDPAN PLOW

A Two-Tooth Plow for Hardpan

The Dukelow hardpan plow, built of heavy structural steel beams and plates, with two teeth, is now being manufactured by the LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa. A heavy I-beam tongue acts as a full-length shoe when the machine is plowing its maximum depth of 15 inches. The teeth are set on 24-inch centers and are reversible. Two steel wheels carry the plow when running free or when plowing less than the maximum depth. It is developed particularly for service in sand-rock ledge, macadam, hardpan and loose rock.

The depth plowed is governed by a ratchet gear and lever, plowing a uniform depth of 2 to 15 inches and 4 feet in width. The beam acts as a shoe lying flat upon the surface of the material being plowed, providing leverage that will move hardpan and other stubborn materials. When the plow is in action, the wheels idle or float ahead. The bumper on the front of the plow-beam is provided for backing the plow when it is necessary to remove stumps, boulders, hardpan and frozen earth. The hitch on the tractors is higher than the plow-beam, thus eliminating any unnecessary maneuvering in backing. A steel cable is the only necessary connection between the plow and the tractor, giving plenty of room for turning or maneuvering from any point into action.

Colprovia in Ohio

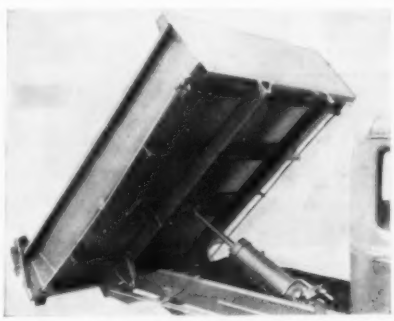
The Ohio Colprovia Co., 406 Marion Building, Cleveland, Ohio, has recently acquired the license to manufacture and distribute Colprovia for the entire state of Ohio. This company has awarded the contract for the erection of its first plant at the Wagner Quarry Co.'s Soldiers' Home Quarry No. 1 at Sandusky, Ohio, to the J. D. Farasey Mfg. Co. This plant will have a capacity of approximately 750 tons daily and the product will be shipped in open cars to any point in Ohio.

The Colprovia process is a completely cold process for manufacturing, shipping and laying an asphalt paving in five different types: sheet asphalt, binder course, asphaltic concrete, fine and coarse aggregate, and asphalt concrete base, commonly called "black base."

Colprovia is a product which contains no volatile materials, liquefying agents or cut-backs and is not an emulsion. It combines a satisfactory aggregate and a low penetration asphalt without foreign or temporary ingredients, and without heat. The Colprovia process was first applied commercially in England and is being used in a number of the principal countries in continental Europe. Its first application in the United States was in 1927, when it was applied in several prominent locations throughout the East.

A Heavy-Duty Hoist for 1½-Ton Chassis

A new power-operated hydraulic hoist for heavy-duty service on 1½-ton chassis has recently been placed on the market by the Wood Hydraulic Hoist and Body Co., Detroit, Mich. This new hoist, known as Model D6, rounds out the line of Wood hoists in the light-truck field. No wood sills are required in installing the D6 hoist, as the hoist and body come ready-mounted in a pressed steel subframe, needing only to be bolted to the chassis. The design is rugged and simple. A 6-inch cylinder bore of seamless steel is so mounted that the piston rod



THE NEW D-6 HEAVY-DUTY HOIST

pushes directly against the load. The lifting point has been kept at a considerable distance from the hinges, to provide greater leverage and ease of operation.

All parts of the hoist have been carefully designed to give maximum strength for the rigid requirements of heavy-duty service. In addition to the 6-inch cylinder, there is also an extra-heavy steel piston rod, heavy-duty hinges of drop-forged steel, a full-size oil pump, and heavy-duty fittings. The entire Wood line of "C" bodies for 1½-ton chassis is furnished with the new D6 hoist.

A New Copper Oxide Film Cutout for Street-Lighting Circuits

A new type of totally enclosed copper oxide film cutout superseding the lead and aluminum disc cutouts for street-lighting circuits has been announced by the General Electric Co., Schenectady, N. Y. The new cutouts for use on series circuits are available in breakdown voltages of 50 to 100 and 100 to 200 volts and are particularly suited for installation in moist climates, as they are hermetically sealed.

The new copper oxide cutouts are stronger, larger and more durable than the lead and aluminum cutouts which they supersede, according to the report of the General Electric Co. A new copper oxidizing process employed in the manufacture of the cutouts enables the dielectric strength to be easily controlled. The copper oxide cutouts with a diameter of ¾-inch are easier for the lineman to handle, resulting in a saving to the user through the reduction of spoilage and loss by linemen.

Healey & Watt, Consulting Engineers

The association of Frank F. Healey and James H. Watt, in the partnership of Healey & Watt, engineers, with offices at 33 North LaSalle Street, Chicago, has been announced. Major Healey, for many years manager of the engineering department of the State Bank of Chicago, and later with the Foreman-State Trust and Savings Bank, has been engaged in the field of civil engineering and appraisal work for more than three decades. He has designed and superintended the construction of all types of buildings, including many power plants. He was General Superintendent for A. Bentley & Sons in the construction of the Acme Power Co.'s power plant at Toledo, Ohio, which cost 15 million dollars. During the World War he served as a major in the Construction Division of the Engineering Corps of the Army, in charge of all field work at Newport News.

Mr. Watt was associated with McClintic-Marshall Co. for seven years, and was later with Allen & Garcia, consulting engineers. He has just returned from Europe, where he acted as consulting engineer in industrial construction projects during the past two years.

Healey & Watt will act as consulting engineers, appraisers and building managers for all types of properties, including residential and industrial.

The Signal Service Corporation Organized

The Signal Service Corporation, with main offices in Elizabeth, N. J., has announced that it has acquired the Traffic Engineering Division of the American Gas Accumulator Co., of Elizabeth, N. J., and the Ray Signs Corporation, of New Haven, Conn. It will hereafter conduct the business of these groups in the development, production and sale of traffic devices.

The combination of resources in the new corporation will facilitate research, development and production of traffic devices and will permit of economies which will be passed on to the consumer in the form of improved products and service and, where possible, lower prices, according to the announcement. The executives of the Signal Service Corporation are: President, A. G. Newton; Vice-President, J. C. Haggart; Secretary and Treasurer, W. F. Burk; and Sales Manager, Guy Kelcey.

Guard the Head from Injuries

EQUIP YOUR DEPARTMENT WITH

BULLDOG HELMETS!

BULLDOG HELMETS are strong, serviceable, protective hats of good appearance, waterproof and molded in one seamless piece of insulating materials. The broad, rigid brim is designed to protect the Face, Eyes, Ears, Neck and Shoulders from falling and flying materials and also to deflect water from the neck.

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Braddock, Thomas and Meade Sts., Pittsburgh, Pa.

"EVERYTHING FOR MINE AND INDUSTRIAL SAFETY"

Whenever You Need Safety Lights

—use *Toledoes!* They defy weather, protect workmen, decrease liability—at a cost 50% less than usual.

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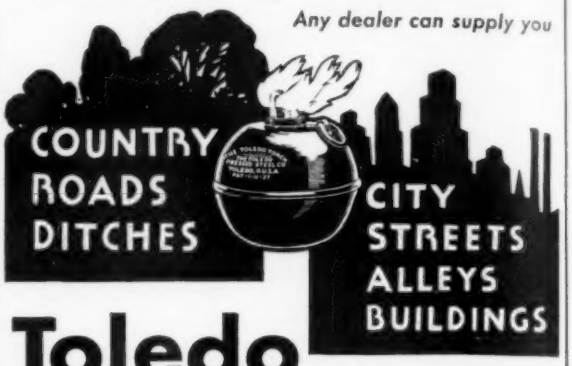

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The Toledo Pressed Steel Co.
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Save with Steel

Manufacturers of The Toledo Horse—the ideal highway barricade

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REINFORCED CONCRETE PIPE

"It makes a better joint"

Easily laid at small expense with perfect flow line

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HICKORY FIBER for ROTARY SNOW BROOMS STREET SWEEPERS HAND BROOMS

HUNTSVILLE Hickory Fiber for all types of brooms is an unconditionally guaranteed product that will give consistent and economical service over long periods of time—sweeps clean the roughest pavements—handles the heaviest refuse with ease. Each fiber is a live, springy, flexible broom filler made from the best selected green hickory, thoroughly cured, and rigorously inspected. It will pay you to investigate, write today.

The Huntsville "Trade Mark" on every bale is your guarantee. Look for it.

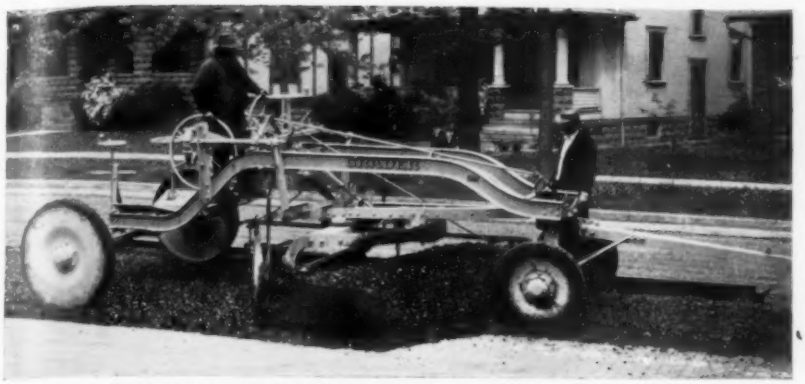
FAULTLESS FIBER
HUNTSVILLE
HICKORY
FOR STREET SWEEPERS

Write today for the Booklet "The Story of Huntsville Hickory"

FRANK H. FORD, President

HUNTSVILLE FIBER & VENEER WORKS

HUNTSVILLE ALABAMA



THE GLEDHILL ROAD ADJUSTER, OR MATERIAL SPREADER, WORKING ON HOT MIX MATERIAL
Note the long straight edge on the far side of the machine

A Blade Spreader and Straight Edge for Road Work

An attachment known as the Gledhill Road Adjuster, for attaching to any standard 8-foot or larger road-grader, and adapted for the patrol of traffic-bound or gravel or earth roads and for the spreading of all types of ready-mixed or mixed-in-place materials, has been developed by the Gledhill Road Machinery Co., Galion, Ohio. The attachment consists of a front and a rear mold-board. These mold-boards are securely fastened on the left to a long straight edge consisting of an I-beam shod with a runner. The rear mold-board is 1½ feet longer than the front board, allowing the overflow from the front mold-board to pass off at the end and be picked up by the rear mold-board and worked back in the opposite direction.

The adjusting bar runs from the right-hand side to the left-hand side of the machine, and carries a spirit level. By adjusting the bar to any desired elevation or crown, the operator has only to watch the level and is assured that he will be blading to the proper crown.

A New Protective Hat for Firemen

Adequate head protection is necessary for every fireman in order to reduce head injuries. Bulldog helmets made by the Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh, Pa., are molded in one piece, without seams, from light-weight insulating materials and will withstand any blow the neck will stand. The broad rigid brim is designed to protect the face, eyes, ears, neck and shoulders from falling and flying materials and also to deflect water from the neck. The smooth finish eliminates the possibility of catching on wires or other obstructions.

The shell of the helmet is of light-weight micarta, and is durable, waterproof and a non-conductor of electricity. Beneath this, the helmet has a tough leatherette lining, which is sweatproof and resilient and distributes the force of any blow on the shell. This lining is interchangeable and easily replaceable. Ample air space between the lining and shell insures proper ventilation and helps to cushion the blow. Felt pads, properly spaced around the inside of the helmet, insure a snug, comfortable fit and permit upward ventilation between the shell and the lining.

THE M-S-A BULLDOG FIREMAN'S PROTECTIVE HELMET

A New Type of Tree Wire Saves Foliage

An improved type of tree wire, an aerial cable necessitating a minimum amount of cutting of foliage in residential districts, has been announced by the General Electric Co., Schenectady, N. Y. The advantages of the new cable include the ease with which splices and joints can be made, and the improved wearing quality of the insulation.

The cable has high resistance to the abrasion caused by trees swaying in the wind, is waterproof, and ages well. It is constructed essentially of copper conductors, either solid or stranded, with 30 per cent rubber insulation; a fibrous protective covering, thoroughly waterproofed; and the assembly bound together by a weatherproof cotton braid.

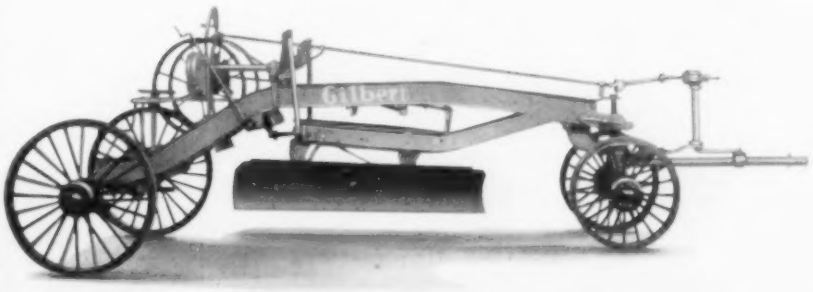
Six Pomona Pumps Installed at Santa Barbara

The city of Santa Barbara, Calif., is planning to increase its present domestic water supply by the installation of six deep-well turbine pumps. It is reported that the city officials, desiring to safeguard the health of the citizens, insisted that the pumps be of the water-lubricated type. Upon the recommendation of Quintin, Code & Hill, consulting engineers, Los Angeles, Calif., six Pomona water-lubricated pumps, made by the Pomona Water Pump Co., Pomona, Calif., with Goodrich cutless bearings, were specified and will be installed immediately in wells drilled on city property.

Three of these turbine pumps, each with a capacity of 525 gallons per minute, are being installed 140 feet below the surface, and are equipped with 30-hp. Westinghouse built-in motors. One of the Pomona pumps, with a capacity of 535 gallons per minute, is set at 120 feet, and is equipped with a 25-hp. Westinghouse motor. The other pumps are set with a 140-foot lift, and a capacity of 460 gallons per minute.

Heavy-Duty Tractor-drawn Graders

Gilbert Pull-Type graders, made by the Gilbert Manufacturing Co., Stillwater, Minn., are built in 8-, 10-, 12-, and 14-foot sizes in plain or roller-bearing type and with leaning or straight wheels. One of the features of this roller is the fact that a ball-and-socket drawbar support makes it possible to tilt the mold-board to a 30-degree pitch for back sloping. The drawbar is so designed that it is outside the grader frame. Therefore, the pull comes direct through the king-pin and to the outer edges of the blade, which allows the grader to do more efficient work. The moldboard can be shifted its entire length to either side.



GILBERT HEAVY-DUTY PULL-TYPE GRADER

FOR DEPENDABLE INSTALLATIONS
use
FARNAN QUALITY
WATER WORKS BRASS GOODS

All types and sizes to meet
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THE FARNAN BRASS WORKS CO.
CLEVELAND, O.
Manufacturers of
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NEW! One-Way Speed Sno-Plow
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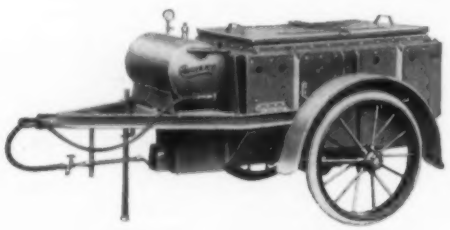

Quality built— for heavy service

Thousands of Connery Kettles in use throughout the world have proved by long and satisfactory service that they are substantially and efficiently built.

Highway departments have found them to be not only excellent equipment, but an actual investment—for their long lives of trouble-free performance insure an absolute minimum of operating and maintenance cost.

Connery Kettles are available in all sizes and types to meet your requirements. WRITE TODAY for the Connery "BLUE BOOK" illustrating our complete line.

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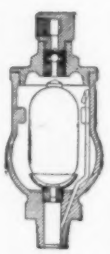
PHILADELHIA, PA.



Complete data sheets sent on request

Apco Automatic Air Relief Valves

For venting air or gas in pumps, pipe line summits and tanks—in fact, wherever air or gas accumulation hinders efficient flow or operation—use Apco Automatic Air Relif Valves. Made in a complete range of sizes for pressures from 10 to 500 pounds and for venting capacity from 3 to 400 cubic feet of air per minute.

We also make the Apco Automatic Primer, used on suction lift unsubmerged centrifugal pump. Positive as gravity; any capacity. Ask for bulletin.

AUTOMATIC PRIMER COMPANY
1466 Conway Building Chicago

HONHORST TAR HEATERS

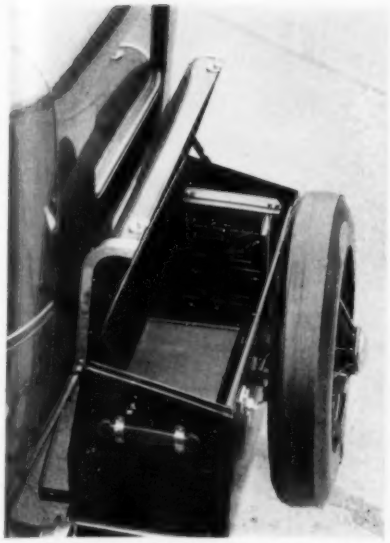
"Built for service"

ALL STYLES
Portable and Stationary
25 to 200 gallons

See our page in Street Construction Section, Municipal Index, for the Kettle you need.

Write for Pamphlet No. 15 on the New Oil Burning Heater

THE JOS. HONHORST CO.
1016 W. 6TH ST. CINCINNATI, O.



STROMBERG-CARLSON POLICE RADIO INSTALLED IN TRUNK ON A ROCHESTER, N. Y., POLICE PATROL CAR

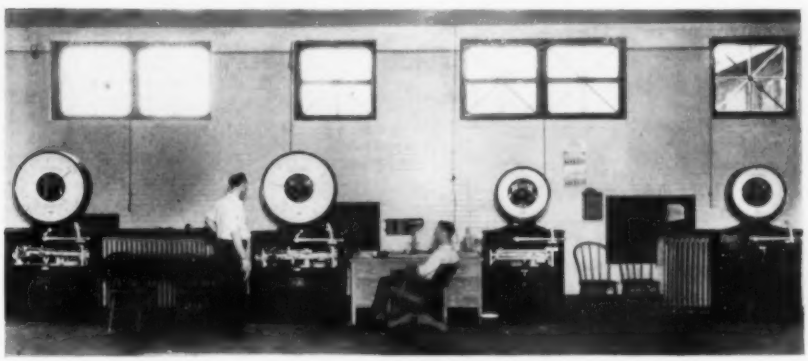
An Improved Police Radio Receiver

A new type of radio receiver designed for installation on police patrol automobiles has been placed on the market by the Stromberg-Carlson Telephone Manufacturing Co., Rochester, N. Y. After experimenting for some time, Stromberg-Carlson engineers have designed and built a receiver to rigid specifications to stand the severe service imposed in police work. The complete receiver consists of the receiver unit, loud speaker, control box and two antenna plates.

Great care has been taken in this to guard against mechanical damage due to vibration. The chassis base is of heavy steel and is mounted in an enclosing case of the same material. The case is on a standard shock-proof mounting. The superheterodyne circuit is used to obtain high sensitivity and selectivity. Ample pre-selection is used to prevent cross modulation and the reception of "image frequency" signals. Automatic volume control is incorporated in the receiver. It functions over a wide range of signal strength to regulate the sensitivity of the receiver. This keeps the sound output uniform over the operating range of the control. This feature is extremely useful, as it eliminates the necessity of operating a manual control whenever the signal strength changes, which is almost continuously when driving around a city.

The "A" or filament current is taken from the car battery and is approximately two amperes. The "B" and "C" voltages are obtained from three heavy-duty "B" batteries and the necessary "C" batteries. Seven tubes, including five screen grid, one general purpose, and one output, are used in the receiver. Special tubes have been developed for this purpose with the heater so rated that extremely low "A" battery drain is obtained.

The loud speaker is an efficient magnetic cone type. It may be mounted either to the roof of the car or on the back of the front seat. It is well protected against mechanical damage by a heavy casing. The control box is arranged to mount on the steering column by means of a clamp. The volume lever control is mounted in the control box to set the sound output of the loud speaker to the desired level, which is maintained uniformly by the automatic volume control feature. The antenna consists of copper screen mesh installed in the roof of the car.



A BATTERY OF TOLEDO SCALES AT THE MINNEAPOLIS WATER WORKS, USED TO WEIGH THE 1-TON CHLORINE CONTAINERS AND CONTENTS

New Scales Installed at Minneapolis Water Works

At the Minneapolis, Minn., water works, new chlorine gas weighing equipment necessitated the installation of new scales. The Toledo scales which had been in use for over eleven years had to be replaced. Investigation by the Minneapolis Council and the City Engineer showed that these scales had given accurate service at all times with low service costs. Because of this, it was decided to replace the old scales with eight new Toledo scales, made by the Toledo Scale Co., Toledo, Ohio, for weighing the chlorine gas containers.

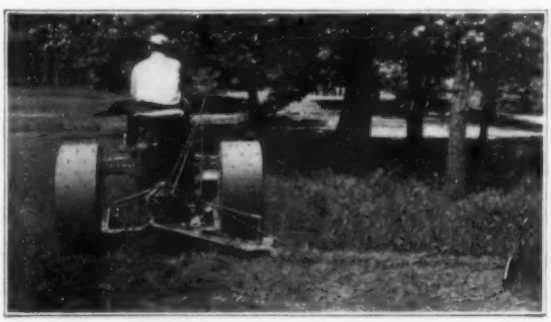
An All-Purpose Golf Course Tractor

The McCormick-Deering Fairway tractor, made by the International Harvester Co., 606 South Michigan Avenue, Chicago, Ill., is a practical all-purpose power plant for golf course construction and maintenance. It meets all requirements for fairway maintenance, for mowing the rough and for construction and improvement work. It is easily controlled and turns in a circle with an 8-foot radius. It works in close quarters, turns quickly, cuts close to obstacles and out again, leaving a very small amount of lawn to mow with hand labor.

In addition to supplying power for maintaining the course, it may be used to pull rollers, compost distributors and dump-wagons uphill and down, over smooth going or rough, or it can be shifted immediately to jobs of plowing, disking, harrowing, seeding and distributing fertilizer. It can also be used in golf-course construction and improvement work, for removing dirt, materials and equipment and, when necessary, the Fairway will operate equipment on the belt or power take-off efficiently.

The Fairway-powered mower made by this company is well adapted for mowing in the rough, opening new turf or cutting fast-growing and obstinate weeds left by the lawnmower. One man operating this unit, cutting a 7-foot swath can cover a large area in a few hour's time. The mower is attached quickly to the Fairway tractor and is operated by the tractor engine, the power being delivered through the transmission and power take-off.

The cutter bar is free to float along the ground, either end free to rise or fall in conformity with the contours. If the cutter bar strikes an obstruction, it will swing back, thus preventing breakage. A slip clutch on the shaft avoids breaking any part, should a hard object become caught in the knife.



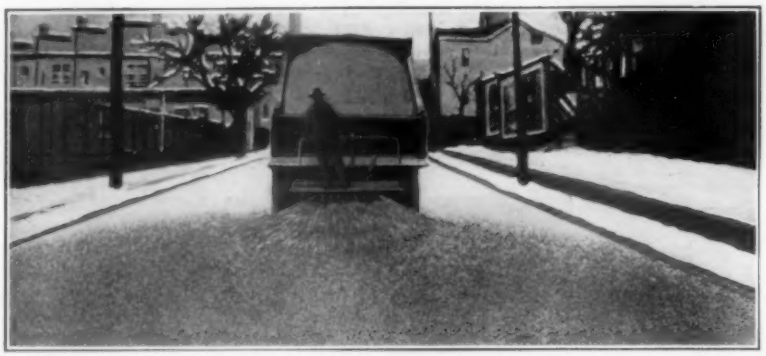
A FAIRWAY MOWER FOR TRACTORS

Caldwell of Ludlow Dies

James H. Caldwell, dean of waterworks manufacturers and Chairman of the Board of Ludlow Valve Manufacturing Co., Troy, N. Y., died on November 18. For many years he was active in the Water Works Manufacturers Association. A native of Mobile, Ala., he graduated from Rensselaer in 1886.

"HVASS" SPREADERS

CONQUER SLIPPERY PAVEMENTS



SPREAD FULL WIDTH OF STREET OR ROAD AT ONE TIME, OR ANY PART THEREOF

SPREAD—SAND, ASHES OR CINDERS

CAN BE QUICKLY ATTACHED OR DETACHED FROM MOTOR TRUCK

WRITE FOR BULLETIN TO

CHAS. HVASS & CO., Inc.

OFFICE: 508 EAST 19TH ST. *Established 1872* **NEW YORK CITY, N. Y.**

See Our Exhibit of Road Building and Maintenance Equipment at the Road Show of the American Road Builders Association, to be held at Detroit, Michigan, January 11th to 15th inclusive.

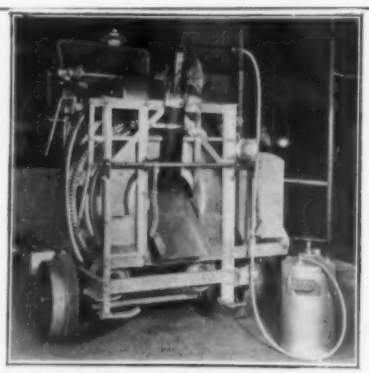
Hotstuf

CONCRETE HEATERS

FOR ANY CAPACITY MIXER, TILTING OR NON-TILTING

OIL-BURNING TORCHES
WATER HEATERS
SALAMANDERS

Write for Bulletin No. 15

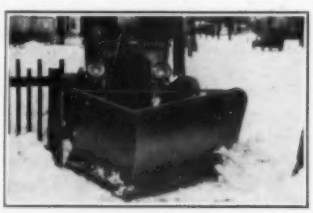


MOHAWK ASPHALT HEATER CO.

Schenectady New York

PIVOTED-V-SNOW PLOW *for Sidewalk Work*

Plow is provided with a pivoting device that enables either side of plow to swing-in when striking posts, lot stakes, trees, etc., along edge of walk.



By dropping a pin in pivoting mechanism, plow can be held rigid for street or alley use. Quickly detached when storm is over. Will not injure truck, as all the push is taken at a point just back of cab, at two places on chassis frame.

ROOT SPRING SCRAPER CO. KALAMAZOO MICHIGAN

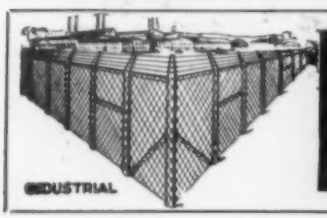
LAY

Lay Split Hickory Fibre

for street cleaning brooms is made by special-built machinery which insures higher grade product. A trial will convince you. Write us for prices.

THE LAY MANUFACTURING COMPANY

DALLAS J. G. Carrier, *Manager* NORTH CAROLINA



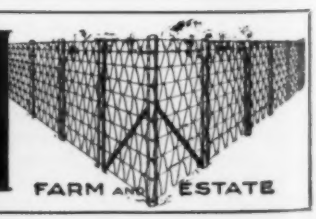
INDUSTRIAL

SWEET'S STEEL POSTS

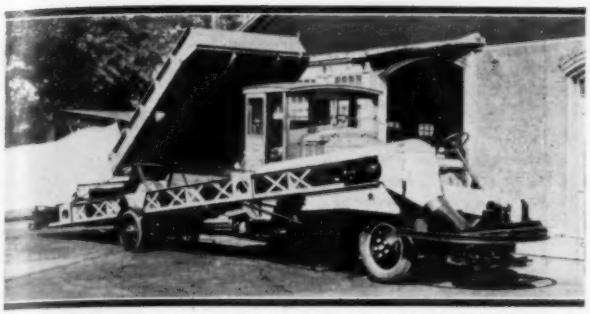
Rolled from the highest grade Carbon steel --- easy to drive --- self contained --- with pleasing appearance and high safety factor.

Write for Descriptive Catalog

SWEETS STEEL COMPANY
WILLIAMSPORT, PA.



FARM AND ESTATE



THE NEW RELIANCE SAND AND GRAVEL SPREADER

A New Sand and Gravel Spreader

The Reliance sand and gravel spreader, which spreads fine or coarse sand, or sand and gravel, dry or as it comes from the bank, to cover oil or ice, or to build and maintain sand and gravel highways, has recently been announced by the Universal Road Machinery Co., Kingston, N. Y. The amount of material applied, the width and depth of the spread, and the direction of travel, are under the operator's control from a seat conveniently located at the head end, where he can observe closely the work being done. This machine spreads a heavy cover from 8 to 12 feet wide or sands any width up to 30 feet. The material is placed ahead of the spreader and truck, so that they are both always traveling on covered surface. While the capacity depends largely on the type of coverage required, the Reliance spreader will handle up to 60 tons an hour. When spreading heavy cover, it operates at 5 or 6 miles per hour and when sanding at 10 to 15 miles per hour.

The spreader consists of a short and a long conveyor, together with a revolving disc working in unison. The short conveyor is pivoted at the foot of the long conveyor and can swing out to permit the loaded dump truck to be attached, after which it swings back of, and is attached to, the rear of the truck chassis. At the head of the long conveyor is an adjustable chute, which carries the material down to a circular distributor with selective speeds, this distributor providing adjustments to meet the varying conditions of material and coverage. The spreader has its own independent power unit, which operates the spreading mechanism as well as the two belt conveyors, three gear ratios being provided. Motive power is supplied by the truck.

The Reliance spreader can be operated with any standard dump truck. With the body of the truck elevated to dumping position, the material is delivered to the short cross conveyor, passes to the long conveyor and thence to the distributor. When empty, the truck can be uncoupled and a loaded unit attached in two minutes, according to the manufacturer.

A Small Full-Swing Crane

The Manly Full-Swing crane, made by the Western Machine Works, 1312 West 22nd Street, Chicago, Ill., is adaptable to utility work of all kinds, such as digging manholes, excavation work, setting up transformers and light poles, laying water mains, gas pipes and sewer pipes, backfilling, and handling heavy timber such as bracing in vaults and congested places where space is limited. Small towns that cannot support a larger crane will find it economical for road work and grading and for public parks, airports, etc. It may be used to load trucks in small spaces, for piling timber and for loading and unloading freight cars.

THE MANLY FULL-SWING CRANE

The winch and controls are located immediately above the turntable, making it possible to operate the crane continuously in any direction, as there is no twisting of cables when the crane revolves. The turntable is unusually sturdy, for it revolves on rollers with track both above and below the rollers. The automatic feature of the counterweight, which can be increased or decreased to meet requirements, increases the range of weights of loads that may be handled.

A steel front-end stabilizer attached to the crane main frame immediately behind the Manly bumper transmits the weight of the load on the steering spindles when the tractor springs have been partly depressed. Weights can be lowered by power or dropped as desired.

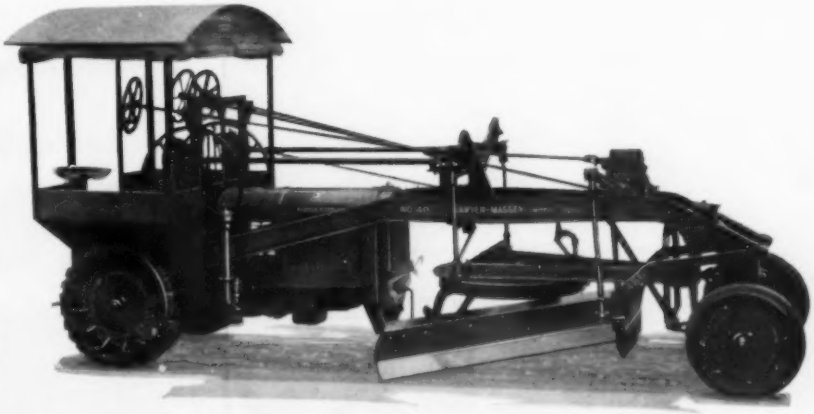
The brakes are of the heavy V-type, assuring control over the load at all times. Separate clutches for all units are capable of operation in any combination, and all operating levers are controlled from the driver's seat.

Tractor-drawn Semi-Trailers for Heavy Service

Some of the advantages of Imperial semi-trailers, made by the Imperial Trailer Co., 1611 Central Avenue, Minneapolis, Minn., are their convenience in the hauling of heavy or bulky loads, the proper distribution of the pay load, short turning and spotting loads in close quarters. Coupling or uncoupling of the trailer from the tractor is quickly and easily accomplished.

The semi-trailers are made in 3-ton, 5-ton and 8-ton capacities in either high-platform or low-slung types, and with special bodies. All models are equipped with Timken roller bearings, external brakes, and Trail-It hitch. The low-slung models have a platform height, empty, of 25 inches, and a road clearance of 10 inches, while the high slung type platforms are 44 inches high and have a greater road clearance.

The low-slung models in 5-ton and 8-ton capacities have platforms 5 x 15 feet and 6 x 12 feet, respectively. The platforms of the high models are all 6 x 15 feet.



IMPERIAL SEMI-TRAILER

For Sale: A Bargain for Some City, County or Contractor

This complete asphalt paving plant, used only 6 weeks, for sale at 2/3 original price. Capacity 250 tons per day. First class condition. New machine guarantee. Fully portable. Oil Burners. Term payments if desired. Complete description on request.

Other products—Oil Burning Surface Heaters, Fire Wagons, Tar Kettles, Concrete Mixer Heaters, Kerosene Torches. Write for illustrated catalogs.

Chausse Oil Burner Company

Elkhart Indiana

Type "B" Servicised Expansion Joint is of special quality asphalt and selected fibers — very low in moisture absorption—and with unusual conformity to expansion and contraction movements together with maximum control of oozing.

This Reinforced Expansion Joint was developed for requirements demanding rigidity and strength in fillers. The core of fiber is heavily saturated with high-quality asphalt and reinforced on the sides by sheets of saturated felt.

Servicised Expansion Joint Suitable for every condition—hot, cold, wet, dry

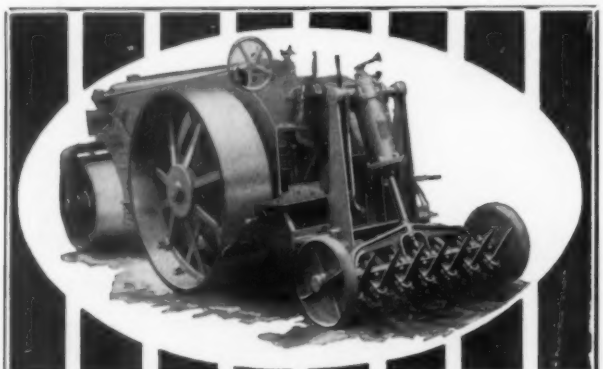
Servicised Expansion Joints *take care of temperature and moisture variations.* They not only prevent the cracking and self-destruction of pavements, sidewalks, etc., but they preserve indefinitely the tightness, alignment, permanency and original form of any and every portion of a monolithic structure. Their small cost adds little to the original outlay, and is quickly made up, many times over, out of the savings in maintenance. *Let us send you a copy of our Catalog No. 11.*

Sponge Rubber Joint
Asphalt Rubber Joint

Telephone: Grove Hill 0423

SERVICISED PRODUCTS CORPORATION

6051 W. 65th Street Chicago, Ill.



BUFFALO-SPRINGFIELD

Whether on the construction or maintenance of important city thoroughfares or national highways, the greater the need for speed, the greater the likelihood of finding a Buffalo-Springfield expediting the work.

Built in a wide range of sizes. Steam and motor driven. Three-wheel and tandem. Scarifier and other attachments optional.

Write for illustrated booklet

THE BUFFALO-SPRINGFIELD ROLLER CO.
SPRINGFIELD, OHIO

ROLLERS

Modern

Dependable

Economical

Money Makers

DODGE TRUCKS

PAYLOAD CAPACITIES IN THE HEAVY-DUTY LINE RANGE FROM 3,600 TO 11,175 POUNDS—AND UP, FOR TRACTOR AND TRAILER SERVICE. PRICES ARE EXCEPTIONALLY LOW. . . . THE STANDARD LINE RANGES IN PAYLOAD CAPACITY FROM 1,200 TO 4,300 POUNDS AND INCLUDES THE ½-TON CHASSIS AT . . . . . $595 F. O. B. DETROIT

THE NEW LINN TRACTOR AND SNO-PLOW IN ACTION

A 75-Horsepower Tractor for Snow Removal

The new heavy-duty 75-horsepower Linn tractor model 4-28-D equipped with the Linn-Frink Sno-Plow made by the Linn Manufacturing Corporation, Morris, N. Y., has a number of outstanding features. Practical tests have shown that this new model has a lower first cost, longer life in all wearing parts, and lessened maintenance and upkeep. The new tractor is equipped with a four-cylinder HS Waukesha motor with 15 and 20 per cent more torque than the earlier 6-cylinder unit.

Besides being practical and economical for all-year-round dirt hauling and heavy transportation work, and a powerful vehicle which will haul through muck and mud, with the Sno-Plow attachment it is particularly adapted to snow removal. The plow is furnished complete with two 14-foot leveling wings, a plow-lifting device, a wing hoist assembly and all braces and bolts, ready for attaching to the new Linn tractor without the necessity of drilling holes or the use of special tools. Ease of steering and the absence of side thrust are obtained by the design of the cutting edge and moldboard. The cutting edge has a slight sheer, just enough to keep the snow moving at all times on the front of the moldboard, yet not enough to produce a hindering side thrust. Hard crusted snow is readily lifted and broken up before being carried to the sides by the moldboards. It is then picked up by the leveling wings and carried to the sides, leaving a clear space from 14 to 22 feet wide, according to the adjustment of the wings.

For traveling from one job to another, the entire plow is quickly raised by the Frink worm-gear lifting device, operated by a hand wheel located immediately back of the cab. This lifting device is attached to the front of the Linn tractor by substituting four longer bolts furnished with the Sno-Plow and is rigidly braced to the top of the leveling wing hangers.

An Auto Patrol Snow-Plow

An effective piece of road maintenance equipment which can also be used for snow moving has been announced by the Caterpillar Tractor Co., Peoria, Ill. In most large cities it is imperative that the snow be removed from the streets as soon as possible; furthermore, speed is essential in some types of snow removal to throw the snow off to one side.

The design of the rear axle of the auto patrol snow-plow with the absence of a differential permits the full power of the engine to be applied to the wheels. The power control of the blade is of decided advantage in avoiding breakage of the plow, for immediate raising or lowering of the blade permits a better-finished job, and a maximum amount of work per hour, since less time is lost in raising and lowering the blade than would be the case with hand operation.

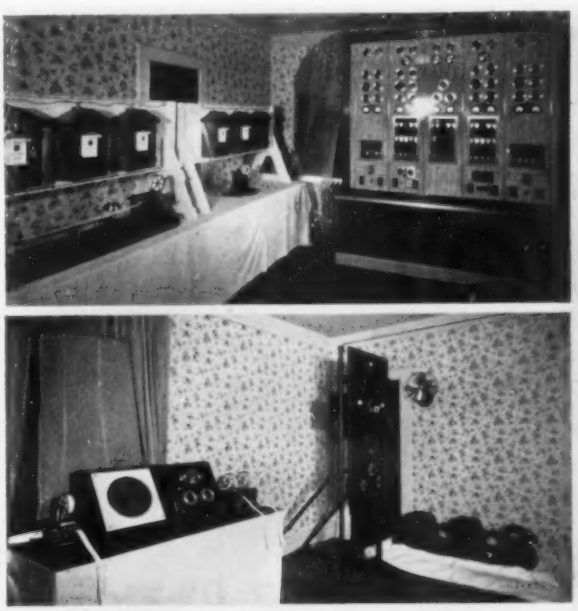
When the streets become coated with ice or frozen snow, the scarifier attachment will enable the cutting-up of this material, and here the positive traction of both rear wheels is vitally necessary.

THE CATERPILLAR AUTO PATROL SNOW-PLOW AND MAINTENANCE UNIT

Interesting Gamewell Exhibit at I.A.M.E. Convention

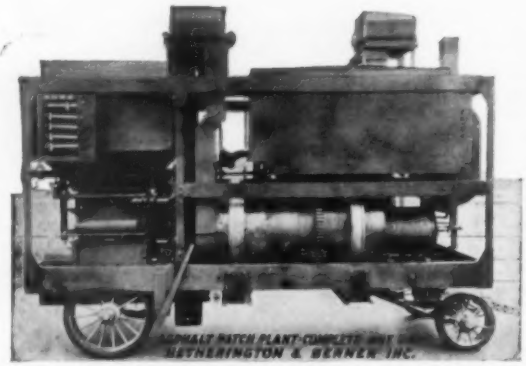
The Gamewell Company, Newton, Mass., exhibited a complete new 3-Fold fire alarm central office display for the convention of the International Association of Municipal Electricians held during the last week of October in Jacksonville, Fla. The exhibit consisted of central office equipment, two box circuits, and an engine-house recording set, making a complete 3-Fold system. This was set up in a special room in the Hotel Mayflower at Jacksonville and was in addition to the regular display in the main convention exhibit hall.

The new 3-Fold box has been on the market for the past year, during which time it has been adopted officially as a standard fire alarm box by scores of cities throughout the country. Surveys have recently been completed in several cities which are in the market for new fire alarm systems, and they have definitely decided on a complete 3-Fold equipment, because of the added protective features which it offers. This system permits a full alarm to be received from any one box despite the following circuit troubles: open circuits; grounded circuits; box short-circuited; entire circuit shunted out; circuit open and grounded; circuit open and box short-circuited; and circuit open and entire circuit shunted out. This system also permits all alarms to be received from all boxes except those between "troubles" under the following complicated conditions: open circuit in two or more places; circuit grounded in two or more places; and circuit open at one place and grounded at another.



THE GAMEWELL 3-FOLD FIRE ALARM CENTRAL OFFICE DISPLAY AT THE INTERNATIONAL ASSOCIATION OF MUNICIPAL ELECTRICIANS CONVENTION

Top.—This section shows the 3-Fold switchboard, one old style and five new 3-Fold fire-alarm boxes connected to two box circuits, and an engine-house recording set. Bottom:—The central office transmitting and recording equipment, the special motor generator and the power control panel for the 3-Fold system



A Real Asphalt Patch Plant

A PORTABLE UNIT WITH A CAPACITY OF 400 YARDS PER DAY

ACCURATE CONTROL OF MATERIALS ASSURING ACCURATE MIXTURE TO COMPLY WITH ANY STANDARD SPECIFICATIONS

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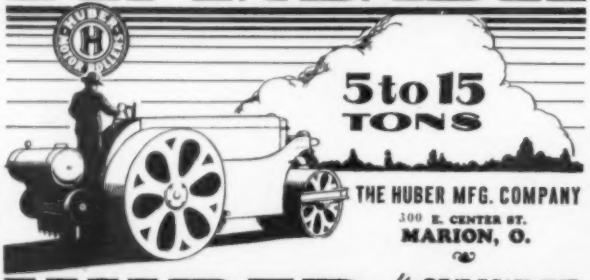
HETHERINGTON & BERNER, INC.

INDIANAPOLIS, IND.

Stationary — Railway — Portable & Semi-Portable Plants

DEPENDABLE



THE HUBER MFG. COMPANY
300 E. CENTER ST.
MARION, O.

HUBER 4 CYLINDER MOTOR ROLLERS

ACCOMMODATIONS FOR *TWO* IN A DOUBLE BEDDED ROOM at the USUAL SINGLE RATE! . . $3.00 to $5.00 Daily

600 Bright, sunlit rooms . . . each with bath, electric fan, and ice water. Adjacent to every activity.

HOTEL PICCADILLY

45th ST. WEST OF BROADWAY
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WOOD HOISTS & BODIES

Put WOOD DUMPING EQUIPMENT *on the* JOB—

- Wood is dependable under all conditions.
- Wood is economical to operate.
- Wood is backed by 20 years' engineering experience.
- A complete line is available; every unit sold under Wood's Life Time Guarantee.

Write for descriptive bulletin covering your particular need.

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Whether your visit to the Motor City is for Business or Pleasure or Both.....

You'll find greater comfort, convenience and economy at HOTEL

DETROIT -LELAND

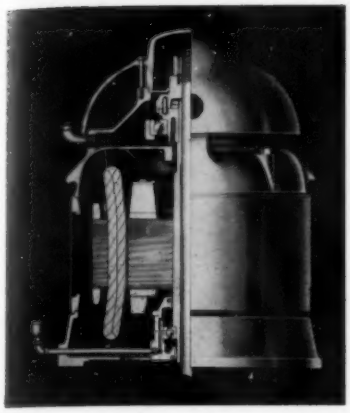
800 OUTSIDE ROOMS
All With Private Bath

SINGLE $2.50 AND UP
DOUBLE $3.50 AND UP

Main Dining Room & Coffee Shop with electrically cooled and purified air

NOW BAKER OPERATED
affording that cordial hospitality for which Baker Hotels are famous.

DETROIT



THE U. S. VERTICAL UNICLOSED MOTOR

A Weatherproof Pump Motor

A new fully enclosed motor, designed particularly for operating turbine deep-well pumps, has recently been developed by the U. S. Electrical Manufacturing Co., Los Angeles, Calif. This U. S. Uniclosed motor is fully protected, with all interior operating parts shielded from abrasive elements, dirt or dripping water. It has an adjustable floating hollow shaft and a dynamically balanced rotor unit. Its reduced over-all height permits a lower center of gravity for pump heads.

The windings are asbestos-protected so that each wire is isolated to resist carbonization of the windings. A non-reversing clutch prevents damage to the pump if the wires should be inadvertently reversed. Another feature is the interchangeable ring base which permits changing the motors of different horsepower rating over a wide range of capacity without involving the expense of re-machining the pump head. This is important in installations, especially where the water level recedes, making it necessary to add more stages to the pump and consequently additional horsepower capacity in the motor. The rotor cage is die-cast solid aluminum in one piece, with the bars and end rings as one integral mass of homogeneous metal. The rotors are die-cast up to 200 horsepower.

A Hydraulically Operated Valve Controlled Electrically

A gate valve operated by a hydraulic cylinder which is supplied with water from either side of the gate and always from the side on which the pressure is the highest, and which is controlled electrically, is manufactured by the Benton Harbor Engineering Works, Benton Harbor, Mich. This Engberg regulating valve is a flat valve which is operated by a piston. The piston is moved by releasing the pressure on either side, by means of small poppet valves which are raised from their seats by an armature and magnet. A standard switchboard is furnished with every valve, having a single-pole, double-throw switch and an alarm bell. The upper contact on the switch operates the valve, and the lower is for the bell, which rings only when the valve opens or closes, according to the way the connections are made. If the valve is connected so that the bell will ring when the valve is closed, and the operator closes the circuit and the bell does not ring, he knows that the valve is open. If he then closes the valve circuit or upper contact for a few seconds and then closes the lower contact or bell circuit again and the bell rings, he knows that the valve is closed. The valve may be operated by hand simply by lifting the small armature on the regulating valve or controlling device. It is claimed that dampness does not affect this valve, and it can be placed in any position.

THE ENGBERG VALVE AND CONTROL

Each valve is furnished with batteries and does not depend on electric current from any other source. It can be furnished, however, to operate on 110 volts DC or AC circuit and 220-volt DC and AC circuits. The switchboard and batteries are placed at the pumping station or any other desirable place from which two lines of No. 8 iron wire or No. 12 copper wire are run to the valve.

The Engberg-Electro-Hydraulic valve may be operated automatically as well as by remote control for use on standpipes, reservoirs, tanks, pumps and filter plants. Controls are also made which open or close the valve completely or will open the valve to any desired position.

Albright & Friel, Inc., Consulting Engineers

Chester E. Albright has recently announced the dissolution of the partnership of Albright & Mebus, of Philadelphia, and the organization of Albright & Friel, Inc., consulting engineers, with Mr. Albright as President, and Francis S. Friel as Vice-President and Treasurer. The new corporation will practice general consulting engineering, specializing in municipal work, including water supply and sewage disposal. In 1890 Mr. Albright opened an office in Philadelphia for the practice of civil engineering and in 1904 he established the firm of Albright & Mebus. At one time he served as Chief Engineer of the Bureau of Surveys of the city of Philadelphia. Mr. Friel was associated with Albright & Mebus from 1922 to the time of the dissolution.

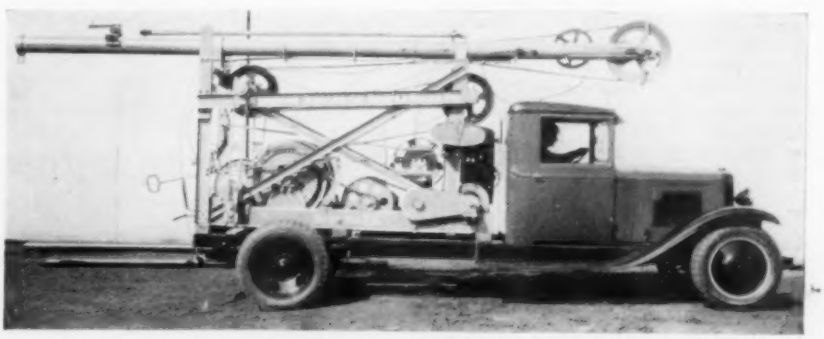
An All-Steel Well Drill for Light Truck Mounting

The latest Keystone well drill announced by the Keystone Driller Co., Beaver Falls, Pa., offers a number of new features. The all-steel, strongly riveted frame of the new No. 70 offers greater length of life and a reduction in cost while maintaining high operating efficiency.

The machine, exclusive of the derricks and tools, can be conveniently packed in one box approximately 10 feet long, 4 feet wide and 6 feet high and weighing about 5,000 pounds. This eliminates the knocking-down usually necessary for larger units when they are to be shipped, as well as the reconstruction of the outfit upon arrival at its destination.

The Keystone No. 70 has a 16-horsepower, 4-cylinder Waukesha engine, producing ample power, and drives through two internal expanding clutches on a countershaft, to the rope drum and the drilling crank. Ball bearings are used on the drilling crank. The main shafts are $2\frac{7}{8}$ inches in diameter, which is oversize for the short span between bearings. This machine can be used with manila cordage or wire drilling cable. With the former it has a depth capacity of 300 feet, and with the wire line a depth capacity of 600 feet. It has a long, rapid stroke, 30 inches over the well and 60 blows per minute, and will handle 1,400 pounds of drilling tools. This insures efficient operation with 3-, 4-, 6-, 8-, or 10-inch drill bits.

The recommended form of mounting for rapid and convenient use is a $1\frac{1}{2}$-ton truck. Any $1\frac{1}{2}$-ton truck with a long wheelbase can be used, and a larger 3- or 5-ton truck can be used without disadvantage. The extra truck capacity can oftentimes be employed for carrying extra tools. For operation in countries where roads are too rough for truck transportation, the machine is mounted on four iron wheels with wide tread and equipped with a tongue and doubletrees for attaching draught animals or a drawbar for tractors.



THE NEW KEYSTONE NO. 70 ALL-STEEL WELL DRILL MOUNTED ON A $1\frac{1}{2}$-TON TRUCK

REAR OF CHAIN BELT MOTO-MIXER RAISED BY NEW HOIST TO GIVE GREATER AREA OF DISTRIBUTION OF CONCRETE

New Hoist Raises Truck Mixer Eight Feet from Ground

A new hoist for truck mixers, called the Jackass hoist, has been developed by the Chain Belt Co., Milwaukee, Wis., for its line of Rex Moto-Mixers and Moto-Agitators. The new hoist raises the mixer 8 feet from the ground for a greater delivery and spouting range. The hoist was developed with the co-operation of the Heil Company, of Milwaukee, manufacturers of the Heil hoist. It is a hydraulic hoist fitted to the rear end of the truck chassis, and raises the discharge end of the mixer just as a jackass raises his heels to kick. The Heil hoist used has been especially designed for this mixing unit. The lifting effort is exerted directly against the load to raise the drum the desired height. The cost of the concrete in the forms is said to be cut from 25 to 50 per cent.

From the height of 8 feet, the concrete can be spouted over an area approximately 75 per cent greater than heretofore. Sidewalks can be poured across parkways without wheeling. Building foundations and walls can be chuted even when the truck cannot get within 10 to 20 feet of the hole. Alleys and streets can be fanned their full width. The hoist raises the drum high enough to discharge into a 3-yard hopper. The flow of concrete can be regulated easily by the operator from a slow trickle to a full discharge by a simple turn of a handwheel. Though the mixer is raised at a considerable angle, the drum empties cleanly and thoroughly.

New Cold-Mix Plant Uses Emulsified Asphalt

The increasing popularity of emulsified asphalts and tars in the manufacturing of bituminous concretes has led to the development of a plant which produces a high-grade paving material with the emulsified product. This plant is manufactured by the Asphalt Equipment Co., Scottsdale, Pa. In this plant crushed slag, stone or gravel is thoroughly mixed with emulsified bitumen by the immersion method, then delivered to the job and handled like dry aggregate, using either rakes, finishing machines, stone spreaders, or even the end gate of the truck, to spread it.

Emulsified bitumen permits the use of a damp aggregate as effectively as dry ones. The plant is portable, and through its use every particle of aggregate is thoroughly covered with a film of bitumen, thus eliminating the fat spots so often found in cold-mix pavement.

This portable plant is built on a sturdy frame of ship channels well reinforced to prevent racking. The four wheels have 7-inch face rubber tires and are equipped with roller bearings. The front axle is pivoted to swing under the body and is provided with a drawbar for easy towing. The elevator boot, which is a part of the truck, is made of 3/16-inch plate and bolted to the truck frame.

The accompanying diagram shows details of the machine. Aggregates are placed in the end hopper, the flow to the apron feeder being controlled by a rack and pinion gate. A well-built elevator of double-strand construction carries the material to the discharge chute. The machine is powered with a 15-horsepower motor, either gasoline or electric, which is equipped with a speed reducer and a standard clutch.

A New Pneumatic Tractor Tire

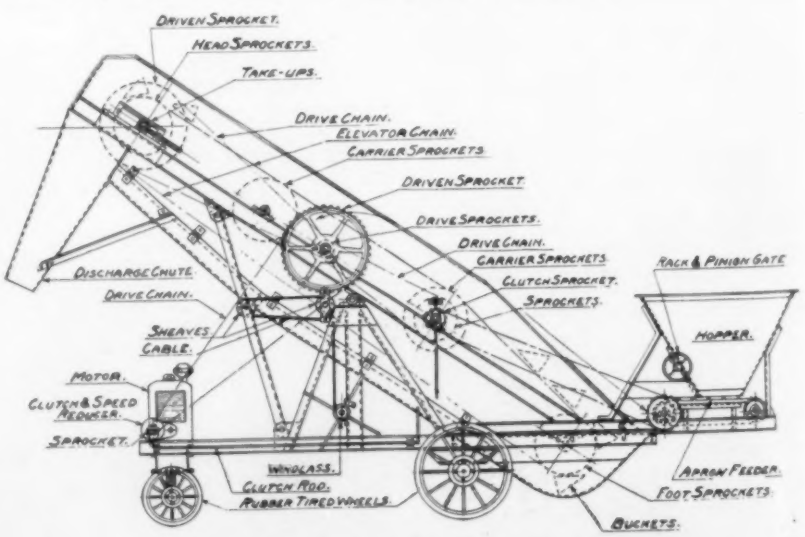
A new development in tires for industrial tractors used for the operation of road machinery has been announced by the Goodyear Tire & Rubber Co., Inc., Akron, Ohio, in its pneumatic-lug tractor tire. These tires are designed and built by the same organization that pioneered pneumatic tires for trucks and busses. They are an entirely new product, however, not a modified pneumatic tire, and are designed for tractor speed, tractor weights and chassis and for tractor requirements for sure-footedness and drawbar pull.

The Goodyear pneumatic-lug tire is made in four sizes, 36 x 6, 38 x 7, 40 x 8, 42 x 9. The two latter sizes take the place of 40 x 10 and 42 x 12 steel wheels or 40-inch solid tires with no appreciable change in gear ratio or motor speeds. The inflating pressure should be regulated according to load for best performance. The following table shows load and inflation recommendations for pneumatic-lug tires in tractor-grader and road-machinery service where speeds do not exceed 20 miles per hour:

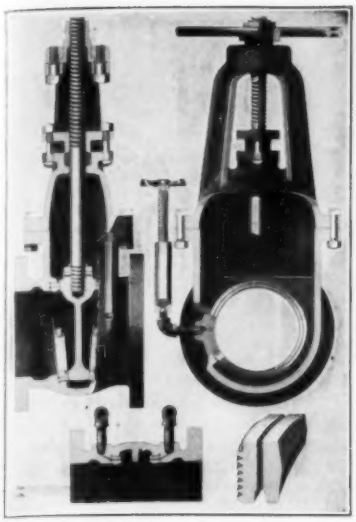
Pressure	36 x 6	38 x 7	40 x 8	42 x 9
40	1,260	1,550	1,865	2,240
45	1,375	1,675	2,000	2,400
50	1,490	1,800	2,140	2,555
55	1,600	1,925	2,280	2,710
60	1,730	2,050	2,420	2,865
65		2,175	2,560	3,020
70		2,300	2,700	3,175
75				3,330
80				3,485

Morris Machine Works Moves Detroit Office

The Morris Machine Works, Baldwinsville, N. Y., has announced the removal of its Detroit, Mich., office to 901 New Centers Building, Detroit, where municipal officials may secure complete information regarding the line of Morris pumps for water works.



A PLANT FOR HANDLING EMULSIFIED BITUMINOUS CONCRETE PAVING



ASSEMBLY OF A LUBROTITE VALVE

A New Principle in Gate-Valve Construction

The lubricant-seal principle of tight seating has been developed in the Lubrotite gate valve recently announced by Reading-Pratt & Cady Co., Inc., Bridgeport, Conn. In this valve there is a unique duct system for introducing a lubricant-seal between the seating surfaces. The valve is sealed tightly even though the seating surfaces have become damaged from sand or gravel in the line, or by corrosion. This valve is said to operate from 25 to 50 per cent easier than non-lubricating valves.

The lubricant seal separates the wedge from the seats slightly, thus freeing the wedge that may have become set from a long period of service. These valves are particularly recommended for water-works systems. They are made in both Pratt & Cady standard and extra-heavy patterns and in Reading electric cast steel. The general dimensions are the same as for the non-lubricated valves, so that Lubrotite valves can be used for replacement service without changing the piping system in any way.

These valves seat tight without the use of the lubricant-seal and can be used, if desired, as regular non-lubricated valves. The lubricant-seals are supplied for various services such as air, gas, water, and chemicals, and are packed in convenient pocket-sized boxes, 24 cartridges to a box. Only a small amount of lubricant is needed for one application.

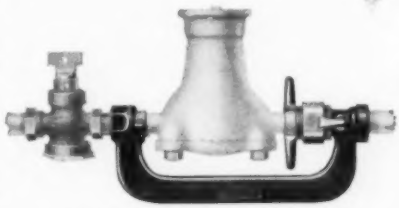
Centrifugal Pumps Work Against a Total Head of 3,400 Feet

Up to the present time, domestic water for the thousands of tourists who visit the Grand Canyon annually has been supplied by tank cars, but with the increasing number of visitors, the Atchison, Topeka and Santa Fe Railway faced such a serious problem that it abandoned the tank-car method of supply and has located a new pumping plant 3,400 feet down the Bright Angel Trail in a meadow fed by springs and located approximately 600 feet above the Colorado River itself.

Byron Jackson Co., Berkeley, Calif., received the order for the first two centrifugal pumps, which will raise the water the 3,400 feet to the rim of the Grand Canyon. Each unit consists of two pumps running in series delivering 75 gallons per minute against the static head of 3,400 feet, that is 1,700 feet on each pump. The machines are vertical, 17-stage, double-case pumps. Each is direct-connected to a 60-horsepower, 3,600-r.p.m., 2,200-volt squirrel-cage induction motor. The manufacturers state that it is certain that ten years ago 75 gallons per minute at 3,400 feet would not have been considered a feasible centrifugal pump proposition and at that time would have been reserved for reciprocating machines.

A New Straight-Line Water-Meter Yoke

Water-works superintendents demand a simple, sturdy and effective setting for shallow installation in meter boxes and for basement settings. This new straight-line water-meter yoke, manufactured by the Mueller Co., Decatur, Ill., has been



THE NEW MUELLER METER YOKE

designed to meet these requirements. It acts as a spacer when putting in the piping, and permits the meter to be set or removed easily at any time. It braces the pipes when the meter is in or out and provides a positive means of preventing the use of water without the producer's knowledge, when the expansion connection is removed. The yoke may be used with any type of curb stop and may be furnished with a union for installation in old services.

The expansion connection is of novel design, permitting it to be left attached to the yoke or instantly removed as desired. The brass sleeve of the expansion connection is locked to the yoke by a hook arrangement which prevents it from turning and also from moving forward when a meter is being removed. Normally, it remains firmly attached to the yoke, but may easily be removed by unscrewing the spindle a little more.

The connection has only two leather gasket joints, both of which are tightened automatically when the meter is tightened in place. The spindle is equipped with two prongs which serve as a handle for hand tightening or permit greater leverage by using the Mueller multiple wrench or a ½-inch nipple.

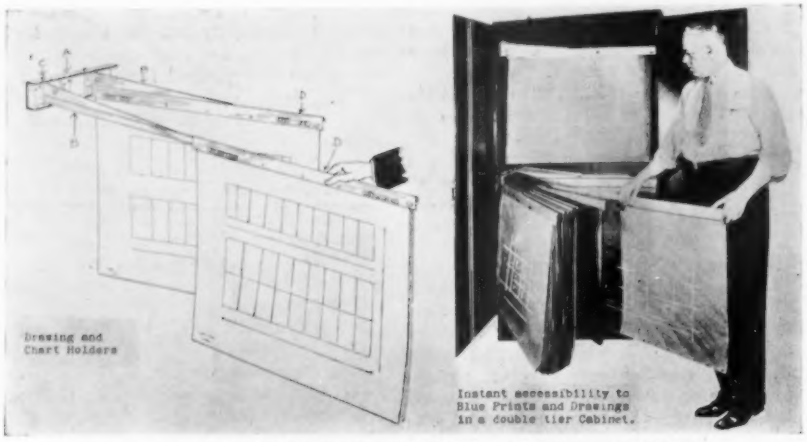
To place a meter, the spindle is screwed completely into the sleeve, leaving the opening up, the meter is dropped into place and pushed back against the spindle face, which is then tightened until the meter is securely fastened in place.

A Traffic Flow Regulator

One of the most difficult problems of officials responsible for the handling of traffic is where traffic varies greatly in volume and direction during different times of day. An intersection timed for light traffic will be hopelessly clogged during periods of heavy traffic, and if timed for heavy traffic, will cause annoying and useless delays when the peak load has passed. The new traffic flow regulator made by Crouse-Hinds Co., Syracuse, N. Y., is designed to solve this problem by operating on a short cycle during the off-peak hours and automatically extending the time allowed for any or all traffic movements during rush hours, thus maintaining the intersection at maximum efficiency at all times.

The feature of the traffic flow regulator is the program cylinder which when once arranged cares for all of the time allowance elements. It is a well-known fact that each intersection develops characteristic peaks, which may or may not be repeated from day to day. Monday's traffic may be characteristic of Tuesday's and Wednesday's, or it may be radically different. Saturday, Sunday and holiday traffic differ greatly from business-day traffic. A week's survey of any intersection will clearly show the hills and valleys in the traffic flow curve. These hills and valleys, translated into vehicles per hour, form the basis for setting the week's program. Once the program of increased time is determined, it is set up on the program cylinder, and the traffic flow regulator automatically extends the time during the hours when it is needed. The program cylinder retains these settings until the character of the intersection changes. It is necessary to change the program only when some physical change occurs at or near the intersection, such as the opening or closing of a nearby street, or when there is some seasonable change in traffic due to the opening or closing of suburban resorts.

THIS MECHANISM WILL HANDLE VARIABLE TRAFFIC FLOWS ON A PREDETERMINED SCHEDULE



A SCHEME FOR FILING BLUEPRINTS, TRACINGS, OR MAPS

An Easily Expanded Vertical File for Blueprints

Filing papers vertically, like correspondence, is inexpensive and gives instant accessibility to every sheet. The Acco Products Co., Long Island City, N. Y., has successfully adapted the vertical system to the filing and handling of blueprints, tracings and similar large sheets. By using interchangeable units, it is possible to start at little cost with only a single holder having a capacity up to 200 sheets, and to build up to indefinite limits by merely adding more holders. The holders are made for all sizes of sheets and at any capacity and can be placed on walls, desks, tables, in cabinets or closets, as may be convenient.

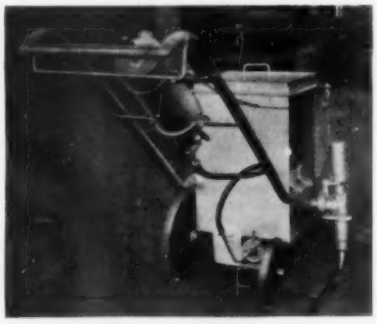
The idea is simple and is shown in the illustration. A channel, "A," having a series of holes in the two flanges, a hanger arm, "B," which is supported in the channel with a pin, "C," and a sheet holder, "D," which slides on the track of the hangar arm and to which the sheets are secured, complete the holder.

After being punched or gummed to strips already punched, the sheets are attached to the sheet holder with double-pronged paper fasteners that bind with a vise-like grip. The compressor of this fastener has sliding keepers for locking the prongs, and these also permit of speedy addition or removal of sheets to or from any part of the file bulk. These same paper fasteners have been effectively used for years for economically binding correspondence and office forms.

Sheets of the smallest size can be filed with the largest, and sheets of unlimited length, by fan-folding and the use of punched gummed paper, are quickly filed for a continuous reading without removal from the sheet holder. The holders are also offered in steel cabinets of several designs and capacities; racks are furnished for vaults as well as vault trucks.

A Hot Asphalt Pouring Machine for Joints

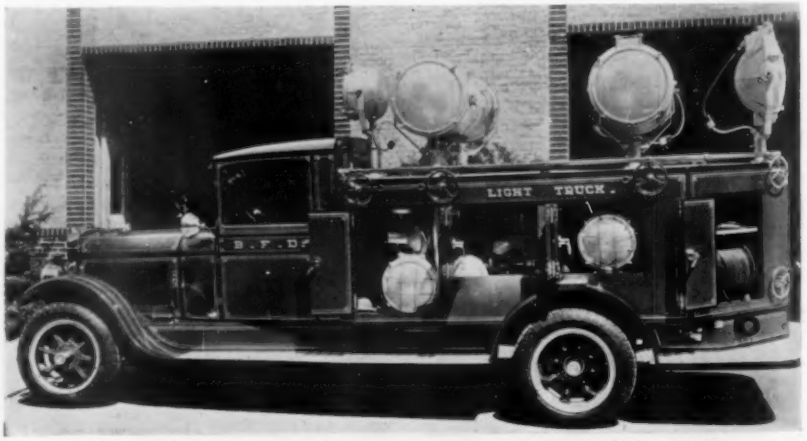
A hot asphalt pouring machine designed especially to pour hot asphalt in pavement joints, such as brick, blocks of all types and expansion joints in concrete, has been developed by the Dobbie Foundry & Machine Co., Niagara Falls, N. Y., and is known as the SavPav hot asphalt pouring machine. This machine places the asphalt where it belongs and not all over the surface, thus retaining the non-skid qualities of the original pavement. Hot asphalt is placed in the swinging inner tank of the SavPav, the asphalt being kept in a hot liquid state by an oil burner. From the inner tank, the hot liquid is carried through the body of the outer tank by a pipe to the control valve. The material flows through this valve, down through one or two nozzles attached to the bottom of the valve, the nozzle being so designed that the hot liquid is discharged in a ribbon shape, thus running directly into one or two joints in the pavement without flowing over the top surface.



THE SAV PAV CRACK AND JOINT FILLING MACHINE

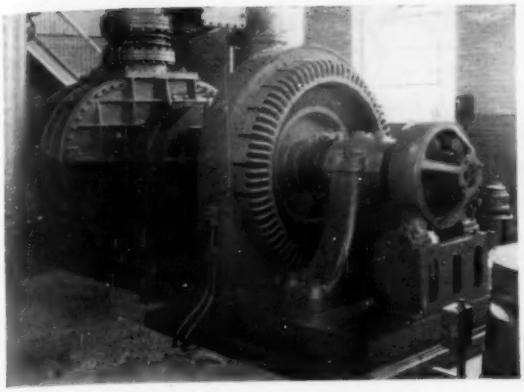
Directly in front of the discharge nozzle is a small steel guide wheel which is held in the joint in the pavement by a guide wheel weight. This weight is located on the top of the slide bar and attached directly to the axle of the guide wheel and moves freely in a machined way cast on the control valve, and no matter at what elevation the valve and the hot asphalt nozzle may be from the surface of the pavement, the guide wheel is pressed down into the crack or joint and in this manner follows the contour of the joint or crack, swinging the inner tank freely either to the right or the left.

At all times the man operating the SavPav has control of the flow by a valve trigger located on the handle bar and by this means the flow may be increased or cut off instantaneously. In addition to the control of asphalt, the man at the handle bar has control of the elevation at which he desires the nozzle above the pavement, by simply lowering or lifting the handle bar. In the handle bar is the oil supply tank, arranged with a pressure oil pump. From the tank is a line leading to the oil burner, with a control valve and strainer. The burner may be removed and the flame directed against the hot asphalt valve when starting. After the valve has been sufficiently heated so that asphalt will flow freely, the burner is returned to the base of the outer tank, keeping the supply of the inner tank in a hot liquid state. The SavPav is also designed to allow the placing of two burners in the base of the outer tank. With this arrangement the machine becomes a melting tank as well as a hot asphalt pouring machine and can be used for repairing cracks in old pavement where a larger supply melting tank is not available.



THIS TRUCK HELPS NIGHT FIRE FIGHTING IN BEAUMONT, TEXAS

The Reo chassis is equipped with a 2,500-candlepower beam searchlight with smoke and fog penetrating power, four 1,000-candlepower intersection lights to be placed at street corners, six 500-candlepower portable searchlights that can be taken into buildings, and a battery of 1,500-candlepower lights. The equipment was built and installed by the City Electrician of Beaumont



AN R-C-W BLOWER IN THE PEORIA SANITARY DISTRICT ACTIVATED SLUDGE PLANT

Heavy-Duty Blowers for Activated Sludge Plants

Blowers of the heavy-duty type are widely used in sewage-disposal plants, where they are particularly adapted for aeration of activated sludge tanks. R-C-W heavy-duty blowers, made by Root-Connersville-Wilbraham, a Division of The International-Stacey Corporation, Connersville, Ind., deliver a definite volume of air at the pressure required. They are of the positive action type, the impeller delivering a uniform volume of air with each revolution. Simple in design and with a minimum number of parts, they eliminate friction and fluid losses usually encountered in handling air at high velocity, and other losses due to leakage, re-expansion or mechanical friction. Freedom from re-expansion pockets is obtained through the special R-C-W impeller design. The frictional losses are small and the volumetric efficiency high.

Heavy-duty machines of 14-inch gear diameter and under, unless otherwise specified, are of the four-bearing type, with narrow face, and hardened steel gears, eliminating the necessity of double outer bearings to maintain gear alignment. In anti-friction bearing machines, where double outer bearings are used, the bearings are located in the gear housing. On the sleeve bearing type, double outer bearings are mounted out side the gear housing.

The heavy-duty roller and sleeve bearing machines of 16-inch gear diameter and above have the wide face gear, six bearing construction, with double outer bearings supporting the shafts beyond the gears, insuring proper alignment with the wide face gears under heavy-duty service.

The impellers are cast of close-grained grey iron, and are accurately finished over the entire contour and held to close limits by planing to templates. They give the maximum displacement consistent with strength, are amply ribbed on the interior and are machine-bored and shrunk onto the shaft. The shafts are hot-rolled, high-carbon steel, finished all over, and are of ample diameter for the loads involved. The roller bearing units are fitted with light-duty stuffing boxes to retain the lubricant.

The Value and Use of a Pipefinder

Not every water-works superintendent, and in fact very few, know where every small main and service pipe of the local system is located. Because of this, some equipment is necessary which will enable water department employees to locate the "missing" pipes without excessive digging. The Caldwell Pipefindr, manufactured by George A. Caldwell Co., Mattapan, Boston, Mass., has been developed for just this service. The principle of the Pipefindr is that the generator sends a current of electricity along the pipe. The search coil can trace the course of this current and

THE CALDWELL PIPEFINDR

therefore the course of the pipe. The generator is housed in a strong mahogany box with the vibrator and terminals upon a small panel. The generator box contains two chambers, one for holding the wire used for making the connections from the generator to the pipe system and also to the batteries. The other is for the headphones and the depth indicator. The search coil consists of a winding entirely encased in a mahogany frame with aluminum corners. It has two terminals for attaching the headphones and a brass post for attaching the depth indicator when being used. The depth indicator is a small brass quadrant with a swinging pointer which when required is fixed to the search coil.

In using the Caldwell Pipefindr, the generator is connected to the water-works system by wires attached at one end to a stop cock or a pipe either outside or inside a building, and at the other end to a hydrant, valve or some other direct connection to the water works from the terminals marked "pipe." This creates a "field." In case the search is for a pipe a long way from a building, the connections may be made from hydrants or valves instead of a pipe or stop cock. For use in finding a pipe used for gas, the same system or hook-up is used.

The generator and the connections to the system should be not less than 15 feet away from the lost pipe, otherwise the operator may be misled by sounds picked up from the generator itself instead of from the pipe. As soon as the generator has been connected to the battery, the vibrator begins to work, and the operator then takes the search coil in his hand and with the telephone at his ears moves about where it is thought the pipe may be located. As soon as he gets near the pipe, he hears a tapping sound in the headphones. He continues to move until he finds the particular spot and position for the search coil which gives him the loudest sound. The pipe is located exactly underneath the coil and in line with it.

Test of Paints for the Inside of Water Tanks

The Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa., manufacturers of water tanks and towers, in conjunction with the borough of Ambridge, Pa., is conducting an extensive test on a 1,000,000-gallon water tank at Ambridge of most of the paints and other compounds suitable for coating the inside surfaces of steel tanks for the storage of water for domestic use.

The inside of the tank shell and bottom has been divided into 196 vertical strips, each strip being painted with a different compound or coating material. The test includes the usual lead and oil paints, asphalt paints, coal tar paints, aluminum and other metallic paints, paints made of bakelite, rubber and other special materials, enamels applied hot, and many new and interesting paint materials.

The tank will be filled with water and placed in service and then emptied at periodic intervals, when inspections will be made and the various paint panels rated by an inspection committee. Reports will be issued after each inspection, and a final report upon completion of the test. As far as is known, this is believed to be the most extensive and carefully planned test of paints for the inside of water tanks that has been conducted.

Thompson Placed in Charge of Manufacturing

A. W. Thompson, who for the past five years has been Pacific Coast Manager in charge of sales for Fairbanks, Morse & Co., Chicago, Ill., has been appointed Vice-President in charge of manufacturing. In 1920 Mr. Thompson joined the Fairbanks-Morse organization as general manager of the Indianapolis plant, and in 1926 he was transferred to San Francisco as Pacific Coast Manager in charge of sales. In 1928 he was made a Vice-President.

Four States Section Meeting December 11

Charles H. Becker has announced that the Four States Section of the American Water Works Association will hold a fall luncheon meeting at the Bellevue Stratford Hotel, Philadelphia, Pa., on December 11.

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Fifth Avenue—The New White Way in Pittsburgh

By **H. A. CAMPE**
Director, Street Lighting Sales, Duquesne Light Co., Pittsburgh, Pa.

WHAT was one of the greatest White Ways of its time, the lighting system of 65 6.6-ampere arc lamps installed on Fifth Avenue, Pittsburgh, in 1915, has now been replaced by a new "Great White Way," which extends on Fifth Avenue from Liberty Avenue to Sixth Avenue, a distance of approximately one-half mile. The new system, comparable in brightness to the best-lighted thoroughfares in other large cities, was sponsored by the Fifth Avenue Association and was authorized by the City Council. The Fifth Avenue Association is made up of merchants and business men located in this section, which is the most important retail and shopping district in the city. Property values are high and represent about one-twentieth of the total property value of the city.

THE NEW LIGHTING STANDARDS ON FIFTH AVENUE, PITTSBURGH, LOOKING WEST FROM WYLIE AVENUE

FIFTH AVENUE'S NEW LIGHTS GIVE AN ILLUMINATION OF APPROXIMATELY 3 FOOT-CANDLES

Conditions have changed in the last sixteen years. Traffic, both vehicular and pedestrian, has greatly increased and there has been a constant demand for greater and better illumination. The fact that well-lighted business sections attract the public has been proved conclusively in Pittsburgh, where considerable attention has been given during the past few years to the problems of adequately illuminating business thoroughfares and main traffic arteries.

The new lighting system on Fifth Avenue is the result of intensive study by street-lighting engineers and of long-continued cooperation between the Street Lighting Sales Division of the Duquesne Light Co., a committee of the Fifth Avenue Association, and city officials.

The old lighting system of 65 6.6-ampere arcs on tubular steel trolley poles has been replaced by 146 6.6-ampere luminous arc lamps of the latest design, mounted on specially designed fluted steel poles with ornamental bases and capitols. Altogether, 73 poles were installed, each supporting two lamps. The poles are equally spaced, approximately 80 feet apart, and at the completion of the installation were given two coats of aluminum paint. Of special heavy-gage steel, the poles were set in heavy concrete foundations, so that they can support the trolley-span wires. It was also necessary to provide duct lines for the installation of 20,000 feet of lead-covered street-lighting cable. At no time during the entire installation was there any tie-up of traffic.

Lighting a New City and a New Bridge

MORE than 100 ornamental street-lighting standards like that illustrated at the left have been purchased by the United States Government for Boulder City, Nev., the new model town which Government engineers are building to house the workmen for the great Hoover Dam project. The new lighting units are being made by the Union Metal Manufacturing Co., and will accommodate General Electric Form 16 luminaires.

The photograph at the right shows one of the arches of the Fourth Street viaduct, the ninth new bridge in Los Angeles, Calif. It is lighted at night by General Electric lantern-type luminaires, of modified Gothic style. The lights are 5 feet in height and have granite opalescent panels and supports of cast silicon-aluminum alloy. The complete installation of lighting equipment on this bridge includes 8 wall-bracket type and 71 duplex type lanterns.

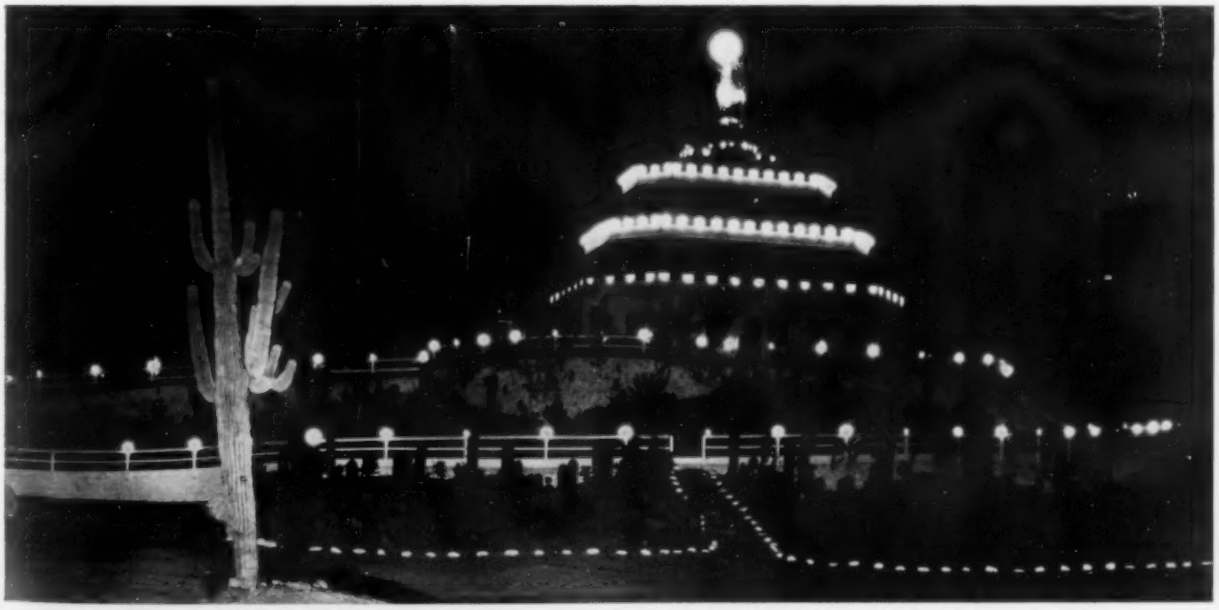
Why Phoenix Is the "Outdoor Christmas City"

PHOENIX, ARIZ., where the sun shines and roses bloom all winter, found it difficult to create the Yuletide atmosphere that stimulates holiday buying in colder climates, until a Christmas lighting campaign was initiated five years ago. The campaign to make Phoenix the "Outdoor Christmas City" has been successfully carried on each succeeding year, with the press and the public at large responding with alacrity. Civic organizations, churches and societies have lent their active support.

When the holiday season approaches, streets, stores, filling stations, homes and churches are decorated with lights. The city is divided into districts, and prizes are offered for different classes of decorations. The newspapers print the details of the awards and stimulate competition by publishing letters describing the displays in various parts of the city.

The city alternates red and green lights in the top globes of the ornamental street-light clusters in all of the downtown business district. On the main street strings of red and green lights are hung for a full mile, and green wreaths tied with large red bows are placed on every post.

Stores vie with each other in decorations. The usual bedraggled Santa Clauses in red flannel and straggly beards are replaced by lighted posts and towers fitted with electric bells. Merchants, cooperating by blocks, place Christmas trees in the flag-sockets on the sidewalks in front of their stores and festoon colored lights along the length of the block. Home owners trim their houses and the trees on their lawns, and the effect of gaiety is contagious.



WINNER OF PHOENIX'S 1930 CHRISTMAS LIGHTING PRIZE: EL CASTELLO TOVREA, A PRIVATE RESIDENCE

Night Games in the Ogden, Utah, Stadium

NIGHT baseball and night football are here to stay. People who work during the day can go to night games, but they can seldom attend games played in the afternoon. The first football game in the Ogden municipal stadium this year was played at night under ideal conditions, and there was an attendance of about 5,000 people.

The stadium contains 24 Giant Mogul floodlight projectors, installed primarily for night football. In order to keep the field entirely clear for day baseball, the projectors were mounted on poles placed immediately in front of the grandstand and bleachers, lighting an area 285 feet in width and more than 400 feet long. A total of 108,000 watts is used, which produces an intensity of 12 to 14 footcandles evenly distributed over the entire area.

PLAYING IN THE OGDEN MUNICIPAL STADIUM BY FLOODLIGHT

At the close of the 1931 semi-professional baseball season, we decided to try a little night baseball to stimulate attendance, despite the fact that the original installation was intended for football and kindred events only. A few changes were made in regard to the location and focusing of some of the lights, and satisfactory results were obtained. Up to August 15 the attendance at baseball games averaged about 150 people. On that date we moved four projectors into right and center field just to experiment with night baseball. The first game between two amateur teams drew 750 paid admissions. The last game of the semi-professional baseball tournament, played at night on September 7, drew a crowd of well over 1,500 people.

During the 1931 season the stadium has also been used at night for such events as concerts, boxing matches and patriotic programs. On the Fourth of July, the Herman Baker Post of the American Legion staged "A Night in No Man's Land," during which the lights were turned on and off to obtain the effect produced by the use of flares "over there."

ALTON W. PARKER,
Manager.

New Photoelectric Relay Operates Street-Lighting Circuits

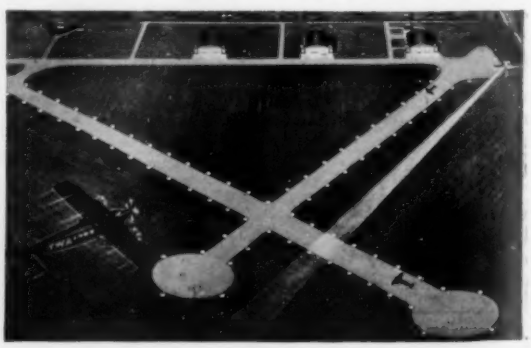
THE accompanying photograph shows one of the new General Electric photoelectric controllers, which turns on the lights in nine street-lighting circuits in Albany, N. Y., when a certain degree of darkness prevails, and turns them off when daylight comes. The unit consists of a photoelectric "eye," a vacuum tube, contactors, time-delay relays, and a weatherproof case. It responds to the increase and decrease in daylight intensity and is designed to control not only street-lighting circuits but also floodlighting installations and other types of outdoor lighting equipment. The eye of the tube is headed north to avoid direct sunlight, and the time-delay relays prevent disturbances by temporary occurrences such as the passing of a cloud over the sun or a flash of lightning at night.

The controller illustrated operates nine of the seventy-five street-lighting circuits in Albany. Other installations will be made to operate the other circuits in the city, and they will also be introduced in Schenectady, Troy and other neighboring cities.

New Runway Lighting at Port Columbus, Ohio

PORT COLUMBUS, near Columbus, Ohio, is the first airport in the country to be equipped with a complete runway marker lighting system. The new equipment, furnished by the Westinghouse Electric & Manufacturing Co., consists of 77 marker lights, placed in a row along each side of the two long runways, with the top of each lens flush with the surface of the field.

After a powerful floodlight on the field has revealed to an incoming pilot that the field is free of obstacles, the marker lights, directed upward, indicate two clearly defined pathways on which he may alight with perfect safety. The runways are made of a hard surface material and it is essential that the pilot land on a runway, particularly in bad weather, rather than to trust himself to the soft surface of the surrounding field. The lights also indicate the exact true elevation of the ground, a valuable feature on hazy nights.



Indiana Street Lighting Law Cited by A. M. E. Committee

A STATE street lighting law makes possible uniformity of street lighting practice throughout the state. With this in mind, the Committee on Street and Traffic Lighting of the American Society of Municipal Engineers studied during the past year the eight state street lighting laws in operation in this country. The Committee's report, presented at the Society's recent convention in Pittsburgh, quotes at length from the Indiana Street Lighting Law, passed in 1929, which the Committee believes may be of interest and assistance to municipal and state officials who desire to procure similar legislative authority in their own states. The following is a summary of the law for the "electric lighting of public streets."

Procedure Outlined. — The law provides that "the owner or owners of real estate in any city block or blocks, fronting or abutting upon any public street or thoroughfare, . . . provided with sidewalks, may sign and file with the board of public works, if there be one, and if not, then with the common council," a petition for the installation of a street lighting system, or for additional lights where a system has already been installed, "in front of the city block or blocks designated and described in said petition." When this petition has been signed by the owner or owners of at least 60 per cent of the real estate in the block or blocks in question, and after any remonstrances which may be made have been considered, the board of public works or the common council may authorize the installation. Provisions are made in the law with regard to execution of the contract, bids and advertising.

Installation and Operation. — "All street lamps or system of lighting constructed, erected, or installed, in accordance with the petition aforesaid, shall be uniform in style and shall be installed under the supervision of the city inspector, electrician, or engineer or of some competent person," designated by the board of public works or the common council. After being accepted by the city, "said system of lighting shall be owned, maintained and kept in first class repair and condition by the utility installing and operating the same," in strict accordance with the agreement.

Method of Payment.—"The city shall pay from its general fund or from a fund set aside for street lighting purposes the entire annual cost of lighting at street intersections and not less than thirty-five per cent (35 per cent) of the annual cost of lighting of the entire other part of such lighting system, the exact percentage to be so paid to be fixed by the board of public works or common council, as the case may be. The common council of such city may by ordinance divide the city for lighting purposes, into business zones, residence zones or other zones and hereafter, on the establishment of lighting systems under this act, the proportionate annual cost of electric lighting of such systems to be paid by the city shall, within each separate one of such zones, be uniform throughout. . .

"The remaining annual cost of such lighting shall be assessed equally per front foot against each lot or parcel of land in the block or blocks in front of which such lighting system is located and the amount so assessed against each lot, or parcel of land, shall become, and is hereby made a lien thereon to be collected as hereinafter provided.

"The city shall make and advance to the utility operating such lighting system all payments required to be made to such utility for its said service, in strict accordance with the terms of the contract or order under which the utility is operating. Such payments shall be made by the city from its general fund or from a fund set aside for street lighting purposes and the city shall thereafter be reimbursed for such payments as are made in behalf of property owners by the collection of the assessments as provided for in this act." The procedure of assessing property is then described.

Additional Installations.—Provisions are made for the installation of facilities additional to those described, which are to be installed by the utility at its own expense and maintained as part of the original system "at such additional compensation for maintenance and operation as may be agreed upon by all parties interested."

Other sections of the law cover the method of handling petitions in municipalities having municipal plants; the procedure in city manager cities; and the repeal of existing acts.

The law also applies to incorporated towns.

Norwood Floodlights Its Municipal Building Nightly

THE $500,000 Memorial Municipal Building in Norwood, Mass. (14 miles south of Boston), is floodlighted every evening until midnight by a battery of six large floodlights. The spires of the 120-foot tower can be seen for miles.

The entire building is of Gothic design and many features were adopted from the Harkness Quadrangle at Yale University and the Graduate Hall at Princeton. The building is built entirely of Indiana limestone, Massachusetts granite and Maine slate. The tower contains a carillon of 51 bells, on which concerts are given during the summer and on holidays such as Christmas, New Year's Day and Easter. The memorial wing includes an historical room, which has not yet been completed, and a memorial hall, with a balcony, which seats about 250. The municipal wing covers four floors and provides space for practically all the municipal departments with the exception of the fire and light departments. Plans are now being perfected for the completion of the fourth floor as headquarters for the American Legion.

C. A. BINGHAM,
Town Manager.

THE MUNICIPAL BUILDING, NORWOOD, MASS.

THERE'S A FLUTED STEEL POLE FOR EVERY TYPE OF SERVICE..

In Topeka, Kansas, Union Metal Poles support trolley span wires, street lights and traffic signals. Despite heavy loading, guy wires are unnecessary.

TWENTY-FOOT Fluted Steel Poles for trolley span wire support—sturdy thirty-footers for distribution lines—ample strength for unusually heavy loading—fifty and sixty-foot poles for cross-country lines. In short, strength and height to meet every pole requirement . . . And for city streets, where appearance is especially important, ornamental pole bases can be supplied in a wide variety of designs.

The application of Union Metal Poles is almost unlimited. Wherever wires are strung overhead, Fluted Steel Poles can do the supporting job, and do it efficiently.

Union Metal Poles are made in one piece from high grade steel, welded with a vertical seam and then cold-rolled. In poles up to forty feet in height there are no horizontal joints to collect moisture and hasten corrosion . . . Fluted Steel Poles take standard fittings, are easily adaptable to unusual requirements and will last for years without heavy upkeep expense.

THE UNION METAL MANUFACTURING CO., General Offices and Factory: CANTON, OHIO

Sales Offices: New York, Chicago, Boston, Los Angeles, San Francisco, Dallas, Atlanta ● Distributors: Graybar Electric Company, Inc.; General Electric Merchandise Distributors. Offices in all principal cities.

Abroad: The Canadian General Electric Co., The International General Electric Co., Inc.

UNION METAL DISTRIBUTION POLES

Why not remember to mention THE AMERICAN CITY?

INFORMATION FOR YOU

THE AMERICAN CITY should always be mentioned when writing for this material which is furnished free. Keep your files up to date by checking over these items each month and writing for those you need.

A NEW BULLETIN ON SINGLE-STAGE DOUBLE-SUCTION PUMPS

506. Catalog B-2 has just been issued by the De Laval Steam Turbine Co., Trenton, N. J., describing and illustrating its line of single-stage double-suction centrifugal pumps of the horizontally split casing design. These pumps are characterized by high speed, high efficiencies and the ability to work against high heads per stage.

A NEW AND MORE FLEXIBLE TRAFFIC CONTROLLER

507. The Eagle Signal Corp., Moline, Ill., will be pleased to send information regarding the new Coordiplex controller for traffic lights, which has much greater flexibility and which will handle all of the common color combinations and cycles for either two or three light signals. This Coordiplex can be used with older Coordiplex systems without any changes being necessary in the older installations.

THE BENEFITS OF SNOW REMOVAL

508. La Plant-Choate Mfg. Co., Cedar Rapids, Iowa, has published a series of bulletins on snow removal describing its complete line of effective snow-plows, and one in particular which tells of the benefits of snow removal.

A PAINT SPRAY TRAFFIC LINE MARKER

509. A highway striping outfit for spray painting a traffic line stripe on public highways and city streets has recently been developed by the DeVilbiss Co., Toledo, Ohio, which will furnish a complete description to any municipal officials requesting it.

A NEW HEAVY-DUTY HOIST FOR DUMP BODIES

510. A new power-operated hydraulic hoist for heavy-duty service on 1½-ton chassis has been placed on the market by the Wood Hydraulic Hoist and Body Co., Detroit, Mich. A complete description of this may be secured direct from the manufacturer.

LUBRICATED PLUGS FOR COCK VALVES

511. A 172-page catalog illustrating approximately 30 types of Nordstrom lubricated plug cock valves has just been issued by Merco Nordstrom Valve Co., 343 Sansome St., San Francisco, Calif. A copy of this catalog may be secured by any municipal officials or others interested in valves made in different metals for handling different liquids, semi-liquids and gases, both neutral and acid.

HIGH-SPEED SNOW-PLOWS FOR LIGHT TRUCKS

512. Bulletin W-31-K issued by the Austin Western Road Machinery Co., 400 N. Michigan Ave., Chicago, Ill., describes completely the Western snow-plows for Ford and Chevrolet trucks. These plows are of the high-speed, single-blade type and are easily detached, cutting a 7-foot wave.

A NEW PORTABLE SCALE FOR WEIGHING MOTOR TRUCKS

513. The Black & Decker Mfg. Co., Towson, Md., will be pleased to send a copy of its new bulletin describing the Turtle-Back Drive-On Loadometer, in which the platform covers all the mechanism, preventing the entry of any foreign matter which might affect the accuracy of the weighing mechanism.

DIESEL ENGINES FOR MUNICIPAL POWER PLANTS

514. Bulletin No. 126 issued by the McIntosh & Seymour Corp., Auburn, N. Y., describes completely the municipal power plant at Colby, Kans., which has rendered the city tax-free. Copies of this bulletin will be furnished by the manufacturer free on request.

WATER AND GAS PIPE

515. Cast iron pipe for water and gas main installations, as well as special castings and flange work of all kinds, are made by the Donaldson Iron Co., Emaus, Lehigh Co., Pa., which will be pleased to answer inquiries regarding its products.

STREET-FLUSHING EQUIPMENT

516. Cities considering the proper method of cleaning their streets should secure first the catalog of Chas. Hvass & Co., Inc., 508 E. 19th St., New York, which contains complete information on Hvass motor-truck flushers and sprinklers, semi-trailer and four-wheel trailer flushers and sprinklers, and the Hvass double-unit semi-trailer flusher.

WATER-METER REPAIRS

517. When meters do not function properly, box them up and ship them by freight or express to the Hydraulic Equipment Co., 522 Court St., Reading, Pa. This company will be pleased to furnish complete information regarding its service in repairing and testing all makes of meters.

MORE WATER FROM WELLS WITH LESS DRAWDOWN

518. The reason why the Johnson well screen produces more water from a given well with a given drawdown, or an equal quantity of water with less drawdown than other screens, is told in a bulletin of Edward E. Johnson, Inc., 2304 Long Ave., St. Paul, Minn., which will be sent gratis on request.

MUNICIPAL MIXED REFUSE INCINERATORS

519. Hiler Engineering & Construction Co., Inc., 122 Livingston St., Brooklyn, N. Y., designers and builders of municipal mixed refuse incinerators, will be pleased to furnish information on incinerators it has built for municipalities and to offer suggestions for the design and construction of proposed units.

MOTOR MOWERS FOR HIGHWAY SHOULDERS

520. The new Rawls super-mower for roadway shoulders is described in literature which may be secured from the Rawls Mfg. Co., 202-210 Iowa Ave., Streator, Ill.

A SPREADER FOR ROAD WIDENING

521. Bulletin No. 121 issued by the Galion Iron Works & Mfg. Co., Galion, Ohio, describes Galion spreaders for asphalt, stone, gravel, slag, etc., and also the special spreader designed for road-widening work, which makes it possible to spread materials to the side of the old pavement without the trucks leaving the paved surface.

A FULLY ENCLOSED PUMP MOTOR

522. A 6-page illustrated bulletin has been issued by the U. S. Electrical Mfg. Co., Los Angeles, Calif., describing U.S. vertical Uniclosed motors and their application to deep-well pump service. Copies may be secured from the manufacturers upon request.

PROPORTIONING CONCRETE BY WEIGHT

523. The Toledo Scale Co., Concrete Aggregate Division, 934 H Street, N.W., Washington, D. C., has issued a series of Bulletins, 9902 to 9910, covering the proportioning of concrete by weight, using the Toledo method, involving the Determination Auto-Gage and a Compensation Auto-Gage with graphic recording of the weights of all the ingredients going into each batch weighed, and showing the compensation for moisture in three additional ingredients.

Return this coupon and you will receive the catalogs requested 12-31

THE AMERICAN CITY MAGAZINE
470 Fourth Avenue, New York, N. Y.

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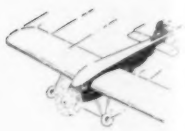
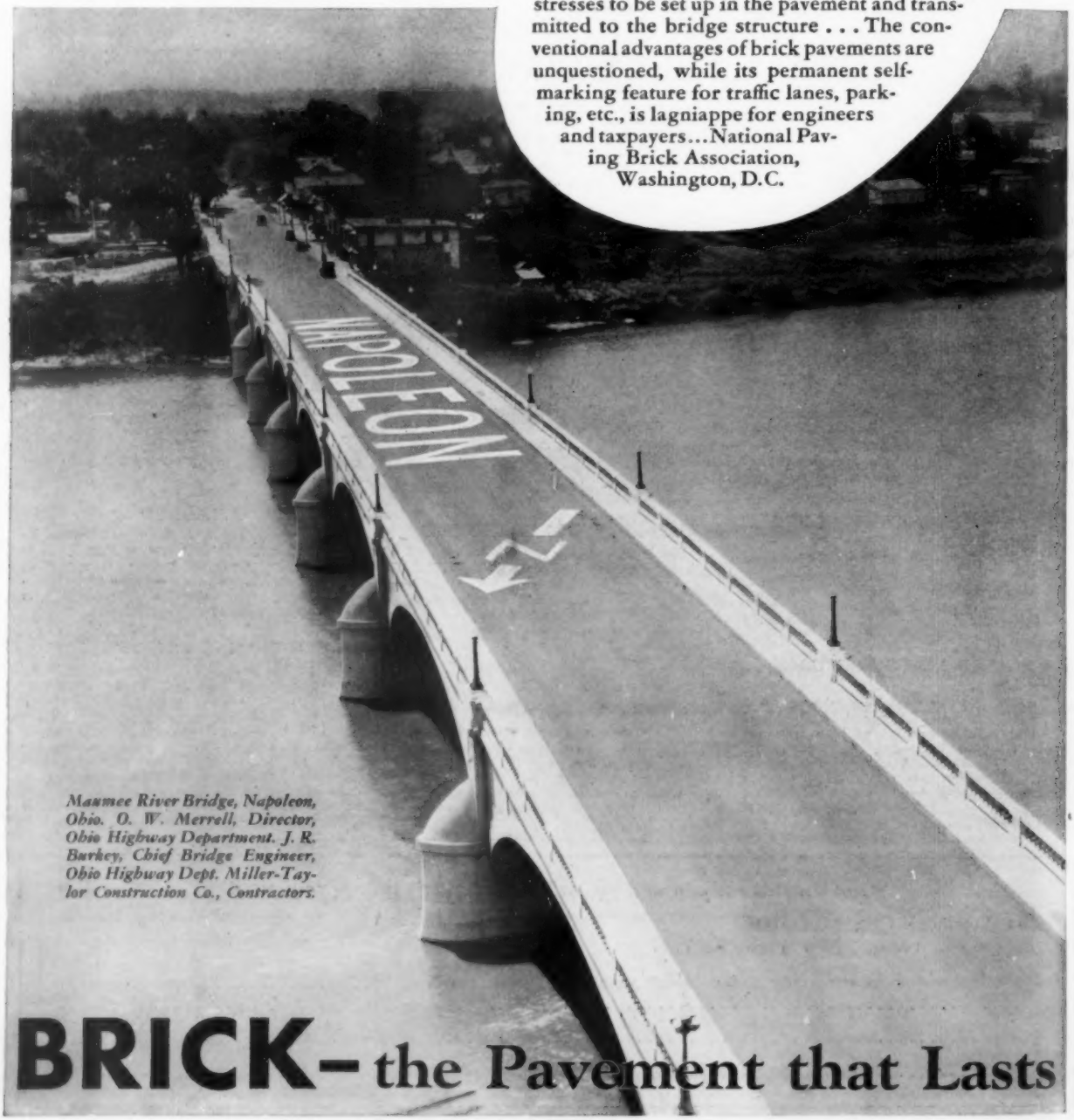


. . . BRICK-PAVED BRIDGES SERVE *AIR* TRAFFIC, TOO

Written in letters 29¼ feet high and 4¼ feet broad with the contrasting colored brick of its pavement, the new Maumee River bridge at Napoleon, Ohio, guides airmen on their course . . . This innovation is consistent. For the Ohio Highway Department paves all important bridges with brick for long life and also because the bituminous-filled joints permit no distorting stresses to be set up in the pavement and transmitted to the bridge structure . . . The conventional advantages of brick pavements are unquestioned, while its permanent self-marking feature for traffic lanes, parking, etc., is lagniappe for engineers and taxpayers . . . National Paving Brick Association, Washington, D.C.



Maumee River Bridge, Napoleon, Ohio. O. W. Merrell, Director, Ohio Highway Department. J. R. Burkey, Chief Bridge Engineer, Ohio Highway Dept. Miller-Taylor Construction Co., Contractors.

BRICK—the Pavement that Lasts

INFORMATION FOR YOU

BITUMINOUS HEATERS AND DISTRIBUTORS

524. Kinney heaters and distributors, for both tar and asphalt, which are made in a variety of styles and sizes to suit the various requirements of contractors and highway officials, are described in literature which the Kinney Mfg. Co., 3541 Washington St., Boston, Mass., will be glad to send on request.

SNOW-REMOVAL METHODS AND EQUIPMENT

525. Under the title, "Keeping Trucks in Condition for Keeping the Highways Open," The Four Wheel Auto Drive Co., Clintonville, Wis., has published an interesting illustrated booklet covering snow-removal methods and equipment, particularly referring to the use of the FWD truck in this type of work. One chapter is devoted to the proper care of snow-removal equipment to prolong the life of the machines.

AN IMPROVED ROAD SHOULDER FINISHING MACHINE

526. Complete information regarding the new Whitcomb-Lehmer road shoulder finishing machine, which is mounted on a Hug truck with a 100-hp. engine and a low gear ratio which permits handling more dirt, and with an adjustable boom to take care of all ditch contours, may be secured from The Whitcomb Locomotive Co., Rochelle, Ill.

AN EFFECTIVE HAND PULLING DEVICE

527. Folders Numbers 10 and 102 describe the large Puljack and Puljack Jr. made by the Puljack Mfg. Corp., 98 Pine St., New York, for moving heavy equipment, spotting and re-railing cars, pulling stumps and trees, wrecking and demolition. These devices, weighing 198 pounds and 46 pounds respectively, are quickly set up and are operated by one man.

AN ALL-STEEL WELL DRILL FOR LIGHT TRUCK MOUNTING

528. The new Keystone No. 70 all-steel well drill in which has been effected a diminution in weight and bulk, and which is readily mounted on 1½-ton trucks, is completely described in a circular which may be secured from the Keystone Driller Co., Beaver Falls, Pa.

FALL AND WINTER PAVEMENT MAINTENANCE

529. Literature describing the use of Tarmac for resurfacing, seal coating and maintaining roads and streets during the fall and winter with a minimum expense for materials and equipment, may be secured by those interested from the Koppers Products Co., Koppers Bldg., Pittsburgh, Pa.

A PORTABLE TOOL BOX

530. The HanDeeBox, a tool box with an arrangement of compartments and shelves to take care of the most complicated collection of tools and equipment, of all-steel construction and lighter than wood, with double covers, two pneumatic-tired wheels and Timken bearings, for municipal departments and contractors, is described in Bulletin No. G-6 which may be secured from Littleford Bros., 500 E. Pearl St., Cincinnati, Ohio.

A NEW PRINCIPLE IN GATE-VALVE CONSTRUCTION

531. Full details concerning Lubrotite water-works valves, which have a unique duct system for introducing a lubricant-seal between the seating surfaces of the valve, can be obtained by writing to The Reading-Pratt & Cady Co., Inc., Bridgeport, Conn.

BRICK PAVING FOR ECONOMICAL ROADS

532. National Paving Brick Manufacturers Assn., National Press Bldg., Washington, D. C., will be glad to furnish to interested municipal and county officials literature describing the use of brick paving for economical and long-wearing roads and streets.

CALCIUM CHLORIDE FOR CURING CONCRETE

533. Bulletin No. 30-750 issued by The Columbia Alkali Corp., Barberton, Ohio, is a well-prepared, instructive report on the current practice of using calcium chloride for curing concrete in pavements, building construction, bridges, culverts and concrete products. Copies of this bulletin may be secured gratis from The Columbia Alkali Corp.

HOIST LIFTS TRUCK MIXER TO 8-FOOT HEIGHT

534. A description of the new Jackass hoist, designed to increase the distributing area of truck mixers, may be secured from the Chain Belt Co., 1667 W. Bruce St., Milwaukee, Wis.

A 2-TON ASPHALT PLANT MIXER UNIT

535. Complete information regarding the new 4,000-pound asphalt plant mixer unit with a radically different steam-operated discharge gate, may be secured direct from Hetherington & Berner, Inc., 701-745 Kentucky Ave., Indianapolis, Ind.

A COMBINED TRACTOR AND ROAD ROLLER

536. The Hercules Crawl Tractor, recently announced by The Hercules Co., Marion, Ohio, combines the usefulness of a tractor and a road roller in one machine. A complete description of this machine, with illustrations, may be secured direct from the manufacturers.

FLOATING COVER FOR SLUDGE DIGESTION TANKS

537. Catalog 32 recently issued by the Pacific Flush-Tank Co., 4241 Ravenswood Ave., Chicago, Ill., and 136 Liberty St., New York, describes completely, with illustrations, the Downes floating cover for sludge digestion tanks and other digestion equipment, including the Marlow sludge pump, gas burners and waste gas burners, and boiler equipment.

NEW DEVICE HANDLES TRAFFIC ACCORDING TO PROGRAM

538. Bulletin 2238 issued by Crouse-Hinds Co., Syracuse, N. Y., describes the Crouse-Hinds traffic flow regulator, which handles a varying traffic flow in accordance with the result of traffic studies which are translated into varying traffic timings on the program cylinder of the traffic flow regulator.

AN ELECTRICALLY CONTROLLED, HYDRAULICALLY OPERATED VALVE

539. The Benton-Harbor Engineering Works, Benton Harbor, Mich., has issued a special illustrated circular on the Engberg electro-hydraulic valve, which is a hydraulically operated valve controlled from a distance electrically.

A NEW PNEUMATIC TRACTOR TIRE

540. Complete information regarding the new Goodyear pneumatic-lug tractor tire, a brand-new development which gives more power, more even pull, more speed, and less breakage depreciation and tire expense for tractor-operated road machinery, may be secured from the Truck and Bus Tire Dept., The Goodyear Tire & Rubber Co., Inc., Akron, Ohio.

A GUARD FOR FIRE HYDRANTS

541. The Sentry Mfg. Co., 139 Princeton St., Medford, Mass., will be pleased to send its illustrated folder describing the Sentry guard, a high-compression guard for hydrant protection which insures against the breakage of hydrants, water loss and fatalities.

LOCATING PIPES FROM ABOVE GROUND

542. An illustrated booklet describing and giving instructions for using the Caldwell Pipefindr has been issued by the George A. Caldwell Co., Inc., Mattapan, Boston, Mass. Copies will be sent free to water-works officials on request.

ASPHALT PAVING IN AMERICAN CITIES

543. The Asphalt Sales Dept. of the Texas Co., 135 E. 42nd St., New York, has published a bulletin telling why American cities have more asphalt paving than all competing types combined. The ten important reasons are listed, and illustrations of notable asphalt pavements are reproduced.

A 75-HP. TRACTOR FOR SNOW REMOVAL

544. The new heavy-duty 75-hp. Linn tractor, equipped with the Linn-Frink Sno-plow for low-cost performance in snow removal, is completely described in literature which may be secured from the Linn Mfg. Corp., Morris, N. Y.

A NEW AUTO PATROL SNOW-PLOW

545. The Caterpillar Tractor Co., Peoria, Ill., will be pleased to send a complete description of the new Caterpillar auto patrol snow-plow, which is a year-round unit furnishing effective road maintenance in summer and snow removal in winter where needed.

A WALL-BRACKET TYPE SANITARY FOUNTAIN FOR SCHOOLS AND OTHER MUNICIPAL BUILDINGS

546. The Puro Sanitary Drinking Fountain Co., Haydenville, Mass., will be pleased to send to any official interested its 45-page illustrated catalog of strictly sanitary drinking fountains for municipal buildings and schools.

FLEXIBLE LEAK-PROOF PIPE COUPLINGS

547. Bulletin A published by the Victaulic Co. of America, 26 Broadway, New York, describes and depicts completely Victaulic flexible leak-proof pipe couplings for steel, wrought iron and cast iron pipes. These couplings, which are self-sealing and automatically leak-proof, combine the features of a straight-line coupling, a flexible coupling, an expansion joint and a mechanically locked joint.

AN 11-FOOT TRACTOR SHOVEL

548. The new Austin Badger, an 11-foot tractor shovel powered with a McCormick-Deering Model 20 industrial unit and having a ¾-yard swing and an exceptionally high lift, is completely described in Bulletin 1236 which may be secured from the Austin Western Road Machinery Co., 400 N. Michigan Ave., Chicago, Ill.

STANDARD-DUTY BLOWERS FOR SEWAGE TREATMENT

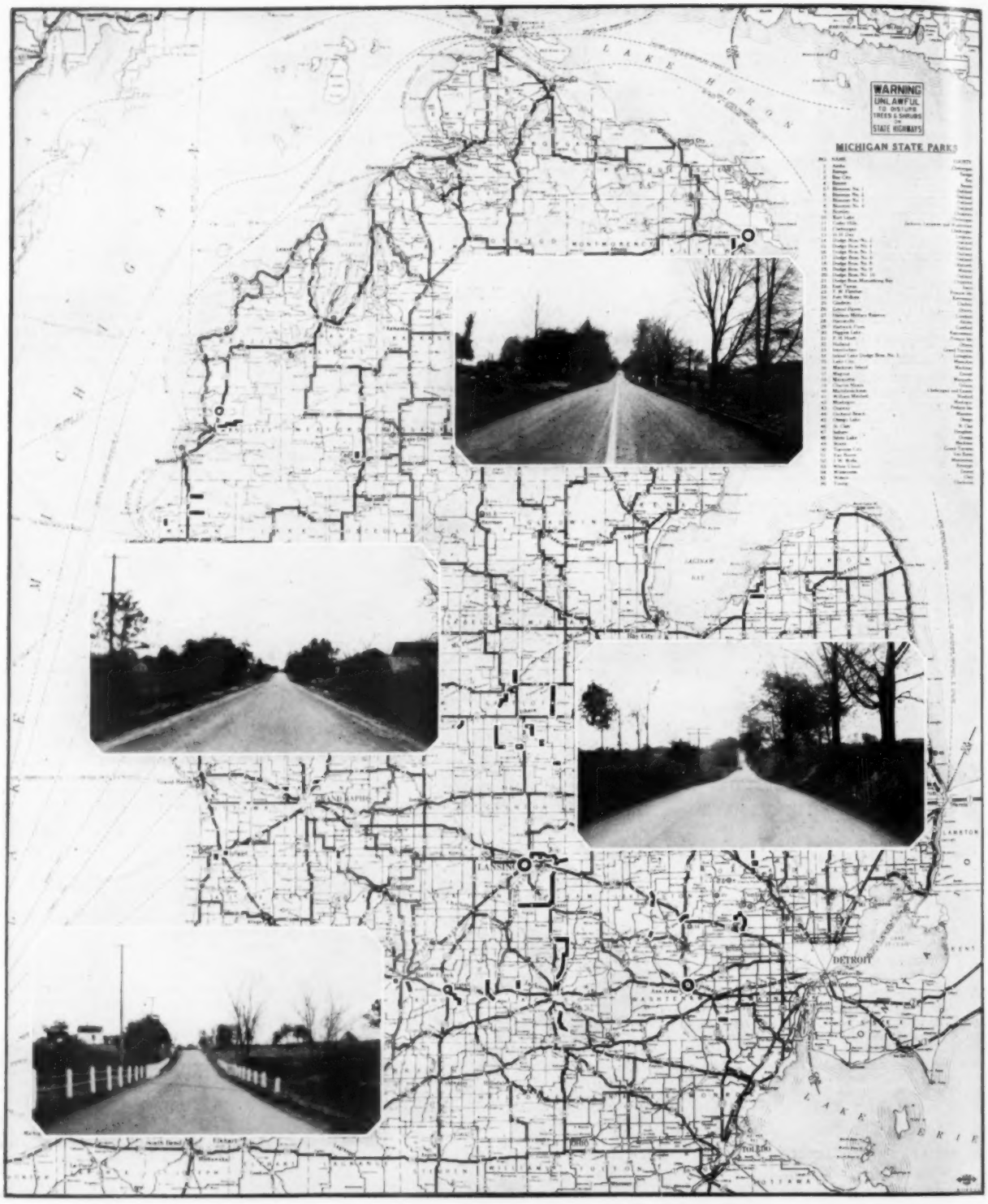
549. Bulletin 23-B-10 issued by Root-Connersville-Wilbraham, a division of the International-Stacey Corp., Connersville, Ind., describes completely, with data tables, the R-C-W standard-duty blowers, which are effective for furnishing large volumes of air at moderate pressure for aeration of sewage in activated sludge plants.

FLOW METERS FOR POWER PLANTS AND WATER WORKS

550. Catalog 2002 issued by The Brown Instrument Co., Wayne and Robert Aves., Philadelphia, Pa., describes and illustrates completely Brown electric flow meters for measuring steam in power plants and the flow of water through mains and from pumps in municipal water works. The Brown electric flow meter operates on the inductance bridge principle, permitting the use of remote recording apparatus.

SHOCK-PROOF POWERED LAWN MOWER

551. The Cooper Mfg. Co., Marshalltown, Iowa, will be pleased to send complete information regarding the Cooper 20- and 27-inch power mowers, which may be equipped with riding sulkies and self-dumping grass catchers. This mower has a shock-proof steel frame, independent Trackson drive, variable speed blade reel, and other notable features.



ASPHALTS FOR

Why not remember to mention THE AMERICAN CITY?

A Type of Low Cost Road Improvement Developed to a High Standard

Low cost improved roads are now in demand because they have five distinct advantages:

1. *More miles per dollar of investment.*
2. *Low maintenance cost.*
3. *Small interest on cost per mile of road with greatest returns on investment.*
4. *Smooth, durable riding surface.*
5. *Labor and material used in construction are available from local sources to the extent of 95%.*

In two years time, the counties in Michigan have constructed 200 miles of low cost improved roads. In building these roads 15,000 gallons of Standard Asphalt Road Oil and 880 cubic yards of gravel were used per mile of 18-foot width road. The road oil and gravel were mixed on the road with ordinary disc harrows and blade graders.

This type of construction has become a standard one in Michigan because it has proved successful. Many highway officials in other states in the Middle West have testified to the economy of and satisfactory service from roads constructed with Standard Asphalt Road Oil.

If you want to know more about the cost of building roads by the method given above, write for specifications and recommendations:

☐ Non Skid Surface for Highways.

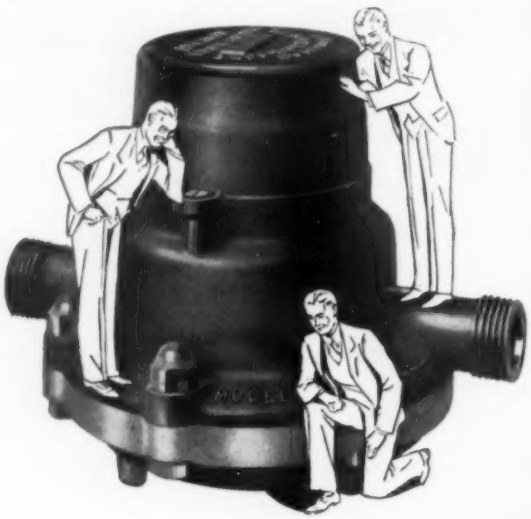
☐ Smooth Self-Cleaning Surface for City Paving.

STANDARD OIL COMPANY
(INDIANA) 112

910 South Michigan Avenue Chicago, Illinois

Billings	Decatur	Detroit	Fargo	Huron	Kansas City	Mason City	Minot	Saginaw	St. Joseph
Cheyenne	Denver	Duluth	Grand Rapids	Indianapolis	La Crosse	Minneapolis	Peoria	Sioux City	St. Louis
Davenport	Des Moines	Evansville	Green Bay	Joliet	Mankato	Milwaukee	Quincy	South Bend	Wichita

EVERY PURPOSE



LISTEN!

Should your auto speedometer start to run noisely, you would hurry to repair the defect, for noise in such a precision machine indicates high friction and wear that must be corrected.

Noise in a precision instrument like a water meter should not be tolerated, either. It is annoying to users of the water and is frequently accompanied by loss of accuracy in the meter.

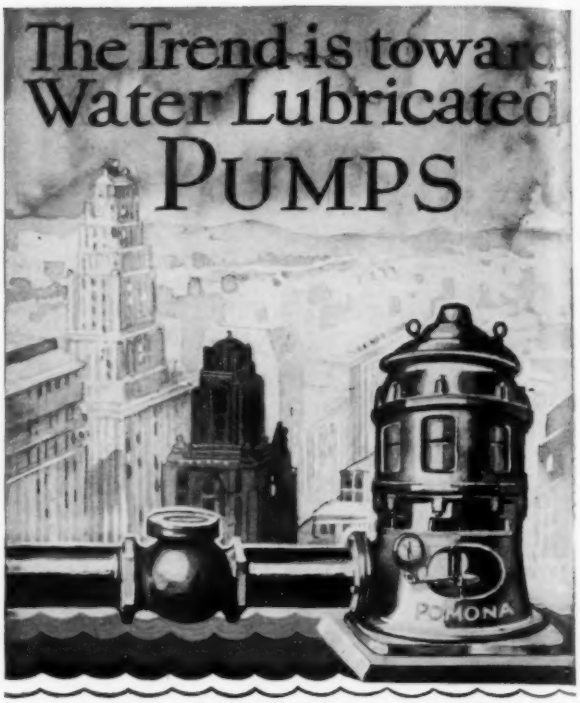
But listen to a Niagara or American Meter! Quietly, smoothly these noiseless meters record the gallons, with the effortless ease and precision accuracy that you associate with the finest machinery. All their lifetime they stay quiet. These are true precision instruments—none finer of their kind—yet so extra-simple that the cost is kept at a proper figure.

The noiseless reinforced measuring piston. It is extra thick to insure extra accuracy.

Just write us today, "I want to listen to a sample."

BUFFALO METER CO.
2902 Main Street Buffalo, N. Y.

NIAGARA and AMERICAN Water Meters



A study of various types of deep well pumps, on the part of waterworks engineers, leads to one logical conclusion—WATER LUBRICATION is the essential factor. So pronounced is the trend toward water lubrication that many health commissioners are insistent upon the selection of pumping equipment that does not require oil below the surface. Pomona Turbine Pumps built their reputation principally upon the elimination of oil lubrication. Years ago water lubrication was a revolutionary idea. Many engineers were skeptical. But today thousands of Pomona Pumps testify to the merit of such a principle and the same engineers are fully in accord with the idea.

Pomona is now selling more turbine pumps than any other manufacturer in the country. Oil-free Goodrich cutless bearings; built-in Westinghouse motors; open-bottom variable capacity impellers; simplicity of design and high efficiency are some of the reasons that have won this popularity.

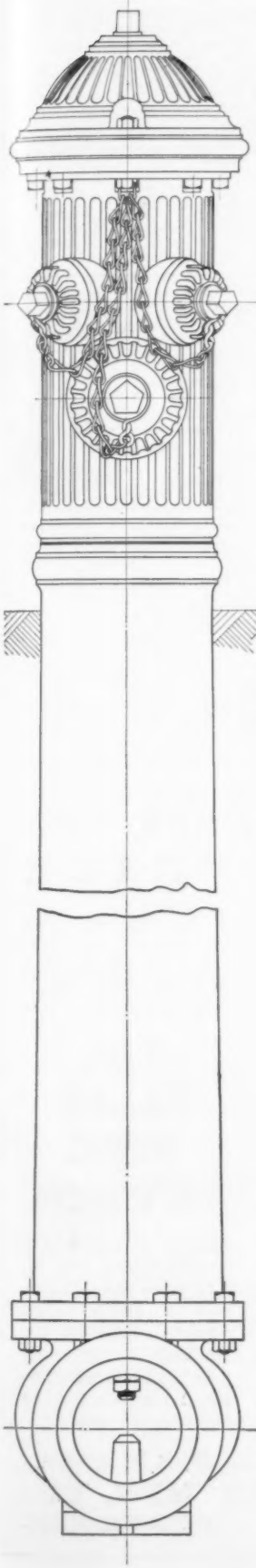
Distributors, factory representatives and service facilities in all principal cities. Name of nearest one and Bulletin on request.

Pomona Pump Co., Pomona, Calif.

POMONA

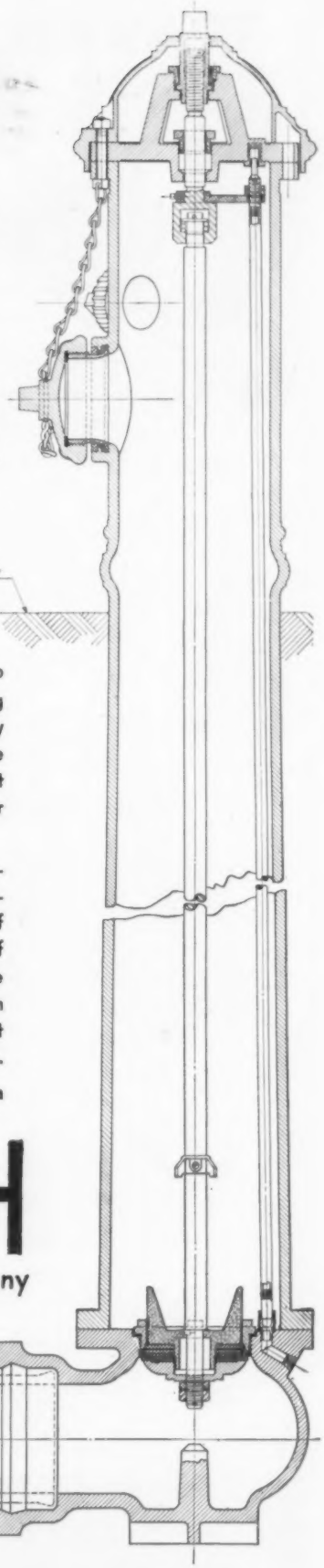
WATER LUBRICATED

TURBINE PUMPS



POSITIVE-ACTION DRIP-VALVE LOW STANDPIPE FRICTIONAL LOSS

THE drip-valve of the O'Brien Hydrant is positive in action. It drains all the water from the standpipe, but no water can pass through it into the ground until the main valve is closed. The possibility of undermining street pavements or sidewalks is therefore avoided.



THE main-stem of the O'Brien Hydrant is in two parts, with a lost-motion connection. In opening the hydrant, the first motion closes the drip. Only after that does further motion begin to open the main-valve. In closing, the main-valve is first closed and only subsequently to that does further motion open the drip-valve.

The design of the valve and of its inlet-seat, combined with the large diameter of the standpipe, results in very low frictional loss. In tests made of this hydrant, standard type, as used by the City of New York, with 4¼" valve-opening 7¼" standpipe diameter, the loss under delivery of two 250-gallon streams was less than 1¾ lbs., while the valve-inlet hydrant, which it replaced, showed a loss of 6½ lbs.

The O'Brien Hydrant may also be had with a two-piece standpipe.

SMITH HYDRANTS

The A. P. Smith Manufacturing Company

East Orange, New Jersey

This type of hydrant is made with 4", 4½", 5" and 6" valve-openings. It is also made for high pressure, in which case the main-valve is fitted with an auxiliary valve to relieve the pressure on the main-valve when opening or closing.

WATER CONTROL

without floats or fixtures

A constant water level can be automatically maintained in reservoirs, tanks and standpipes by the use of

GOLDEN-ANDERSON Automatic Cushioned Controlling Altitude Valves

These valves are always cushioned in closing and opening. There are extensively used for automatically maintaining a uniform stage of water in reservoirs, tanks and standpipes. No valves inside. No floats or fixtures, inside or outside of tanks. No freezing troubles. Three ways of closing these valves:

1st—Automatically, by water
2nd—By electricity, if desired
3rd—By hand

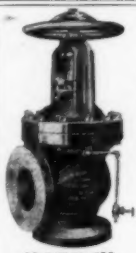
Valves with an Absolute Guarantee

2 in. to 30 in.

Remember: Valves cushioned at all times by air and water. No water hammer or bursting mains.

"Made with stop starter attachment for centrifugal pumps."

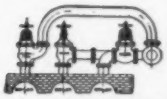
Golden-Anderson Valve Specialty Co.
1329 Fulton Bldg., Pittsburgh, Pa.



Pat. Automatic Double Cushioned Triple Acting Non-Return Valves

1. Prevent shut-downs due to reversal of steam flow.
2. Instantly close and isolate a boiler when a tube bursts.
3. Cut off steam flow from every boiler instantly when a steam pipe ruptures.
4. Automatically cut a boiler into line.
5. Prevent backflow into cold boiler.
6. The only valves that can be tested in service.

"4575"
Used by Steel Cos.



Angle, Globe or Elbow

Patent Automatic Cushioned Controlling Float Valves

They carry a constant water level in feed water heaters by perfectly controlling the flow of makeup water.

Operated by protected enclosed copper float.

Cushioned by both air and water.

Operate without hammering, sticking or chattering. No metal-to-metal seats. Made angle or straightway.

Sizes 1 in. to 24 in.

Pat. Cushioned Water Relief Valves

1. Automatically relieve excess pressure.
2. Prevent stress, strain and bursting of mains.
3. Correct mechanical construction.
4. Perfect air and water cushioning.
5. No metal-to-metal seats. No hammering or shocks.
6. Angle and globe pattern. Sizes 2 in. to 30 in.

Pat. Automatic Cushioned Water Float Valves

1. Automatically maintain uniform water levels in tanks, standpipe, etc.

½" to 24" Angle or Globe

2. Instantly adjusted to operate quickly or slowly.
3. Floats swivel to any angle—most satisfactory float valves known.
4. No metal-to-metal seats—no water hammer or shock.
5. Cushioned by air and water.

Pat. Automatic Cushioned Water Pressure Regulating Valves

1. Maintain a constant reduced pressure regardless of fluctuations on high pressure side.
2. Perfectly cushioned by water and air. No metal-to-metal seats.
3. The best value made for maintaining a constant low pressure where consumption is continuous.
4. Operates quickly or slowly as required—No attention necessary.
5. Positively no hammering or sticking. Sizes to 30 inches.

Announcing

The New

COPPERHORN!

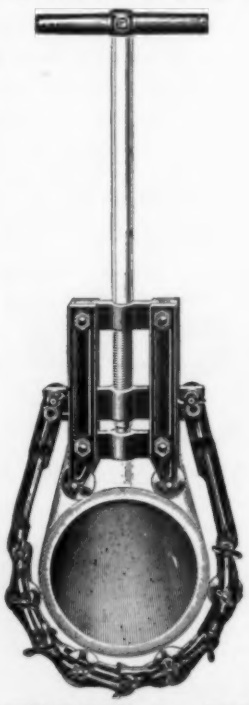
METER COUPLING

SIMPLIFIES BASEMENT METER SETTINGS

IT SAVES meter couplings, pipe fittings, pipe joints and labor in installing. It cuts pipe friction or pressure loss *to less than half* that through the ordinary fittings it replaces. *All copper water way.* Bronze coupling nuts and union swivels assure freedom from all corrosion and rusting troubles. Pipes are connected and in alignment at all times, *whether meter is in or out.* Can be used on old or new services to place the meter at the right height, up out of the dirt, where it can be easily read. *Write today for literature and prices.*

FORD METER BOX CO.
Wabash, Indiana
Water Meter Setting and Testing Equipment

ONE CUT SAVES THE PRICE



YOU, too, may save the cost of this pipe cutter on one job, just as many other companies have done.

The ELLIS PIPE CUTTER

with its six keen rotary cutting blades eats its way right through any pipe in double-quick time. Use No. 01 for all kinds of pipe 4 to 8 inches in diameter, or No. 1 for pipe 4 to 12 inches in diameter.

Write for circular

ELLIS & FORD MFG. CO.
38 Piquette Ave. DETROIT, MICH.

Introducing

"Mr." and "Mrs." of ---------- Pa.

They will tell you of their experiences with an apparent water shortage in their home town.

Let "Mrs." have the first word. (She usually gets the *last* word, like others of her sex.)

Mrs.—

"I certainly am pleased at the way the water situation has turned out. I was having such a lot of trouble with the water giving out or almost giving out, when I was ready to wash the dishes or put the potatoes over to boil, or fill the tea kettle. Mr. Blank, our Borough Manager, said the trouble was, the water mains needed cleaning. I had never heard of such a thing, but I guess he knew what he was talking about!"

Mr.—

"I had my troubles, too. I found it such a nuisance waiting around for the tub to fill up, when I turned on the water for a bath.

"When the trouble first started, most of us thought that what the town needed was a new standpipe, or new mains, or both. We knew there was plenty of water in the reservoir. So a standpipe was built, at the opposite end of the town from the reservoir, and about the same time two miles of new pipe were laid. These helped, but they did not fill the bill. Something more had to be done. Suppose a big fire should get headway. The poor pressure was a real fire menace.

"Our Borough Manager then contracted with a company whose business it is to clean out mains, and our hard-luck story is now over. Ask anyone in this town if he is satisfied with THE NATIONAL METHOD of water main cleaning!"

Note: The name of this town will be furnished on request. It is one of hundreds of satisfied towns scattered all over the United States—towns that have tried THE NATIONAL METHOD of water main cleaning and been more than satisfied with the result. Perhaps your city's mains do not yet need cleaning. But let us send you particulars now so you will be prepared when that time does arrive.

And, before laying new pavements in your city, find out if the mains need cleaning. Avoid tearing up those pavements later!

THE NATIONAL WATER MAIN CLEANING CO.

FIFTY CHURCH STREET NEW YORK CITY

A Quarter Century of Successful Service

THE NATIONAL METHOD

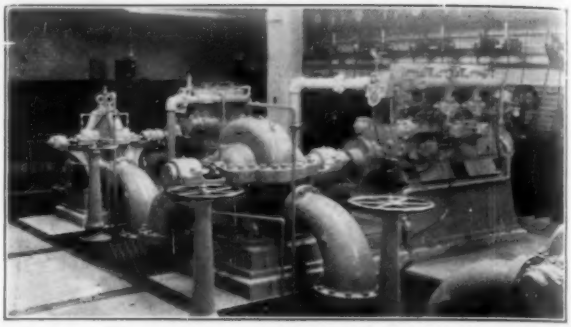
PEAK LOADS AND EMERGENCY SERVICE

can be more cheaply run with—

Sterling High Duty Internal Combustion Engines

Sterling — The Engine of Refinement

12 to 565 B. H. P.
Gas or Gasoline



At Galesburg, Ill., the standby unit consists of a GRC—6-cylinder 235-Hp. Sterling engine direct connected to a 2580 GPM., American Well Works centrifugal pump at 1400 RPM. Consulting engineers: Pearse, Greeley & Hanson of Chicago.

Compare the initial and installation costs with any other type of prime mover. Consultation gratis.

STERLING ENGINE COMPANY

Home Office and Plant 1270 Niagara St., BUFFALO, N. Y. Dept. C11 *Branch Office* 900 Chrysler Bldg., NEW YORK, N. Y.

The EDDY Hydrant

Eddy Fire Hydrants have many points that appeal to water-works men. For example:

A damaged valve can be replaced in a few minutes at slight expense.

Should the standpipe be broken, not a drop of water need be lost.

All hydrants are frost-proof.

These and many other points of excellence are thoroughly explained in our catalog, which it will pay you to study.

Also manufacturers of the well-known Eddy Valves

EDDY VALVE COMPANY

WATERFORD **NEW YORK**

Representatives
Jas. B. Clow & Sons, Chicago, Ill.
National Cast Iron Pipe Co., Birmingham, Ala.

Cast Iron Pipe

for Water and Gas

Cast Iron Pipe and Special Castings, Bell and Spigot, Flange, Flexible Joint, Culvert, Milled and Plain End Tubes, Cylinders, Flanged and Bell and Spigot Fittings, High Pressure Fire Service Pipe, Warren Short Body Specials.

Size 2- to 60-inch

Pipe manufactured in accordance with standard specifications adopted and approved by water works associations and engineers.

Warren Foundry & Pipe Corp.

formerly

Warren Foundry and Machine Co.

Sales: **Bowling Green Building, New York City**
Offices: **75 Federal Street, Boston, Mass.**

The World's
Largest Water
Developers

WHICH WAY ARE WATER COSTS STEERING YOU ?

Municipalities and industries all over the world have learned from experience that LAYNE WATER SUPPLY SYSTEMS can and DO trim appreciably the cost of water production in either large or small quantities. Armed with all the data on water conditions in your territory, a LAYNE engineer is ready any time to help you tackle your water problem.

WRITE, WIRE OR PHONE US

Layne Turbine Pumps
Well Water Systems

LAYNE & BOWLER, Inc.

MEMPHIS, TENNESSEE

SUBSIDIARY COMPANIES THE WORLD OVER

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DAYTON

SERVICE COUPLINGS

A most efficient expansion joint for connecting service lines.

Manufactured in sizes ½ to 2 inches. Side opening type may be tapped any desired size.

THE

DAYTON

PIPE COUPLING CO., DAYTON, OHIO

U. S. MOTORS

New Tempo in Design for deep well pumps

U. S. Motors reflect the most advanced design, embodying Asbestos protection, AutoStart principle, dynamic appearance, normalized castings, etc. Ask for special Bulletin featuring U. S. Uniclosed Vertical Motors for deep well pumps.

VERTICAL UNICLOSED MOTOR

U. S. ELECTRICAL MFG. CO.

Main Offices and Plant, Los Angeles, Calif.
Chicago—325 W. Huron Street
Warehouses and Distributing Offices in Principal Cities Throughout Country

A NEW ERA in UNDERGROUND PIPE and CONDUIT INSTALLATION

Wherever piping or conduit is to be placed underground Hydrauger will do the job with greater speed and economy. Pavement cutting is avoided almost entirely. Hydrauger bores a clean, open hole through which pipe can be run without pushing or jacking. Target-control combined with rigid boring-bars assures accuracy at distances up to 100 feet. Bores 2½ to 10½ inch holes at speeds of one or two feet per minute depending on formation. Write for your copy of latest Bulletin now!

HYDRAUGER CORP., Ltd.
1298 Bryant St. • San Francisco
Distributors in Principal Cities

HYDRAUGER

"The Mechanical Gopher"

After 102 Years

(Above) Unretouched photograph of 102-year-old cast iron pipe still serving City of Lynchburg, Virginia. (Group—left to right) Mr. John Victor, grandson of John Victor, Esq., who conceived the water works project; Mr. R. W. B. Hart, City Manager; Hon. J. Tanner Kinnier, Mayor; Mr. Richard F. Wagner, Director of Public Safety.

FOUR weeks ago the Water Department of Lynchburg, Virginia, uncovered for inspection a 7-inch cast iron water main that has been in service for over 102 years. It is probably the world's first high pressure water line installation.

This venerable yet still vigorous cast iron pipe went into service on July 18, 1829, and was used as a pumping main until 1882 when it was replaced by the 12-inch cast iron main shown alongside in the above unretouched photograph. Since that time it has been used as part of the distribution system and has never given any trouble.

After more than a century of continuous service, this historic cast iron main was inspected, found in good condition, the earth thrown back . . . and it continues to serve, for how long no man can say.

* * *

Serving today in many of our older cities are cast iron gas and water mains that were laid 90 to 100 and more years ago. These long-lived cast iron mains are probably the only example of century-old engineering material which is still giving satisfaction under the radically changed conditions of today. Cast iron pipe's long life has saved millions of dollars to taxpayers.

The reason for the long life of cast iron pipe is its effective resistance to rust. Cast iron is the one ferrous metal for water and gas mains, and for sewer construction, that will not disintegrate from rust. This characteristic makes cast iron pipe the most practicable for underground mains since rust will not destroy it.

* * *

Every taxpayer should take an active interest in the kind of pipe being laid, or to be laid, in his community. For further information write to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 122 South Michigan Avenue, Chicago, Ill.

Cast iron pipe bearing the "Q-check" trademark is obtainable from the following leading pipe founders: Alabama Pipe Company, Anniston, Ala.; American Cast Iron Pipe Company, Birmingham, Ala.; James B. Clow & Sons, 219 N. Talman Avenue, Chicago, Ill.; Donaldson Iron Company, Emaus, Pa.; Glamorgan Pipe and Foundry Company, Lynchburg, Va.; Lynchburg Foundry Company, Lynchburg, Va.; National Cast Iron Pipe Company, Birmingham, Ala.; United States Pipe and Foundry Company, Burlington, N. J.; Warren Foundry and Pipe Corporation, 11 Broadway, New York.

Look for the "Q-check" symbol as shown above. It is the registered trademark of The Cast Iron Pipe Research Association.

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CAST IRON PIPE

Why not remember to mention THE AMERICAN CITY?

KENNEDY

VALVES~PIPE FITTINGS~FIRE HYDRANTS

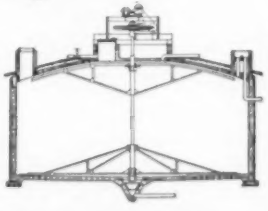
Gate, Globe, Angle and Check Valves furnished for a wide range of sizes and pressures, and arranged for manual, gear, cylinder, or electric operation. Water Gates and Fire Hydrants built to American Water Works Association specifications. Underwriters' approved Gate Valves and Post Indicators. Cast Iron Flanged Fittings and Flanges, Malleable Iron and Brass Screwed Fittings. *Send for Catalog*

THE KENNEDY VALVE MANUFACTURING CO., ELMIRA, N. Y.

New York City Chicago San Francisco Philadelphia Cleveland Atlanta El Paso Salt Lake City Los Angeles Seattle

Sludge Digestors

Clarifiers
Aerators
Sludge Pumps
Coagulation Units
Ruggles-Coles
Dryers



HARDINGE COMPANY
Incorporated
York, Penna.—Main Office and Works
New York—122 East 42nd Street
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MORE WATER—LESS DRAWDOWN

Test after test in laboratory and in field, have proved conclusively the truth of our claim that the Johnson Screen will either give more water with the same drawdown or an equal quantity of water with less drawdown than any other screen. It saves its cost many times over in pumping economy.

Special specifications of Anaconda Red Brass makes the Johnson Screen corrosion-proof.

We shall be pleased to send you our bulletins

EDWARD E. JOHNSON, INC.
2304 Long Avenue St. Paul, Minn.

Roberts Filters

Over a billion gallons of water are now filtered daily by Roberts Filters on municipal water supply systems alone. Hundreds of industrial installations deliver almost an equal amount. Our list of recirculation plant installations includes the most modern outdoor and indoor swimming pools in the country. Write us for information.

ROBERTS FILTER MANUFACTURING CO.
602 Columbia Ave. Darby, Pa.

PURE WATER

Send Us Your Meter Troubles

We solve them in a manner and at a cost satisfactory to you and your patrons. All makes and sizes corrected, repaired, tested, by experts.

When meters do not function properly box them and ship to us by freight or express. We will do the rest and you will be pleased.

HYDRAULIC EQUIPMENT CO.
Formerly READING METER REPAIR CO.
522 Court St. Reading, Pa.

For Drought Insurance — A Kelly Concrete Well!

We *guarantee* that a Kelly Concrete Cased Well will deliver *all* the water that can flow through the surrounding ground strata, and deliver it *sand-free*. Capacities of Kelly Wells range as high as 6000 g.p.m. Write us for advice on any well problem—no charge—unless you choose to buy.

KELLY WELL COMPANY, Grand Island, Nebraska

SIMPLEX VENTURI TYPE METERS

ACCURATE—RELIABLE—SIMPLE—EASY TO CHECK AND ADJUST

Write for Bulletins

SIMPLEX VALVE & METER CO. 6743 Upland St., Philadelphia, Pa.

Manufacturers of Meters and Controllers of Venturi Type; Gauges; Air and Vacuum Valves; Air Release Valves; and other Water-Works Devices

You Sell WATER We Sell METERS

Can't We Get Together on the EMPIRE?

There is one sure way of getting full returns from the water you sell. Simply install the right kind of meters. The right kind of revenue will follow as a matter of course.

The meter that can answer successfully these five test questions is sure to be a safe buy.

EMPIRE Oscillating Piston meters have an unbeaten record of over 46 years for *lasting* accuracy.

EMPIRE meters show a lower percentage of stoppages in service than any others.

EMPIRE meters often run for ten—fifteen—even twenty years without the need of a single repair.

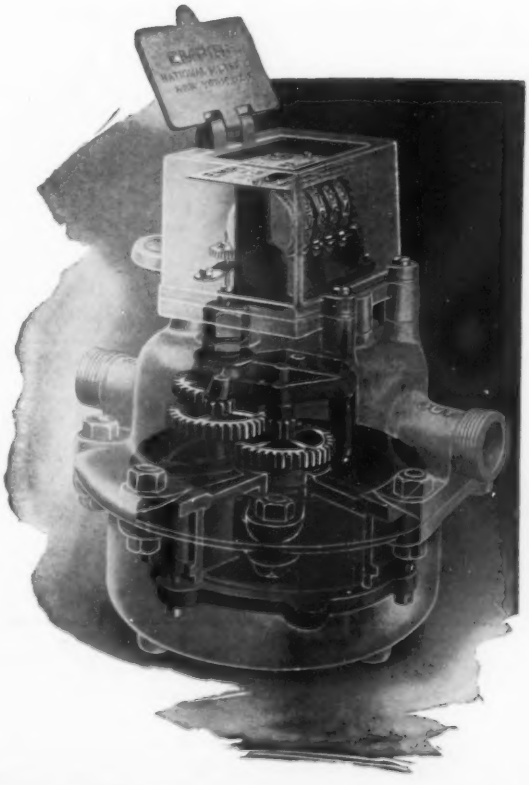
High accuracy plus low upkeep, equal maximum returns on your investment.

EMPIRE Oscillating Piston meters are made in all sizes from $\frac{5}{8}$ to 6 inches, and the large ones are as good as the small ones.

Send for complete catalog No. 300

Test Questions

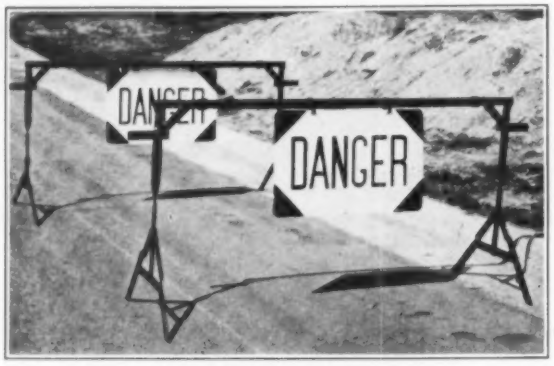
1. What meter will register most accurately on all streams?
2. What meter stays in good working order the longest?
3. What meter makes the fewest stops for any reason?
4. What meter costs the least for refitments and repairing?
5. What meter is the greatest water saver and money earner of them all?



NATIONAL METER CO.

299 BROADWAY, NEW YORK

Chicago Boston Cincinnati Atlanta Houston
San Francisco Los Angeles



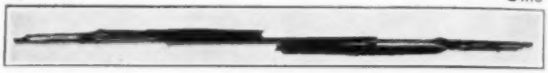
Above: McCurdy Road Guard in Use
At the right: Collapsed for moving to the next job

McCurdy Road Guards

All—Steel—Adjustable—Collapsible

It's a quick and easy matter to close a street to traffic while repairs are going on, if you own a pair of McCurdy Road Guards. They are easy to transport to the job—simply carry them collapsed on your running board. You can set one of these guards up in one minute—and take it down and collapse it in one minute when the job is finished. Being made of all-steel, a McCurdy Road Guard will stand all kinds of hard knocks and won't break or wear out in many long years. It's considered everywhere the most efficient and economical road guard obtainable for street repair work. Price $5.80 each. Write for our illustrated circular.

McCurdy Steel Products Company
Ada, Ohio



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Emaus, Lehigh Co., Pa.

Manufacturers of
CAST IRON PIPE
FOR WATER AND GAS

ALSO SPECIAL CASTINGS AND FLANGE WORK

Since 1869

AMERICAN-MONINGER sludge bed covers are built of the all steel frame type of acid and fume resisting construction and without interior posts.

Write for new catalog describing glass sludge bed enclosures
AMERICAN-MONINGER GREENHOUSE MFG. CORP.
1941 Flushing Ave. Brooklyn, N. Y.
Cleveland—Oklahoma City—Chicago—Amityville, L. I., N. Y.

EBG

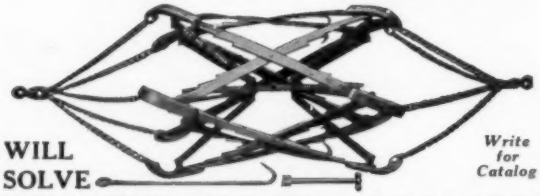
Liquid Chlorine

for Sterilization of Water—
Disinfection of Sewage

Look for the RED Cylinder

Electro Bleaching Gas Co.
PIONEER MANUFACTURERS of LIQUID CHLORINE
Plant: NIAGARA FALLS, N.Y.
Main office: 9 East 41st Street, New York

THE EXPANDING ROOT CUTTER AND SEWER CLEANER



WILL SOLVE THE SEWER CLEANING PROBLEM

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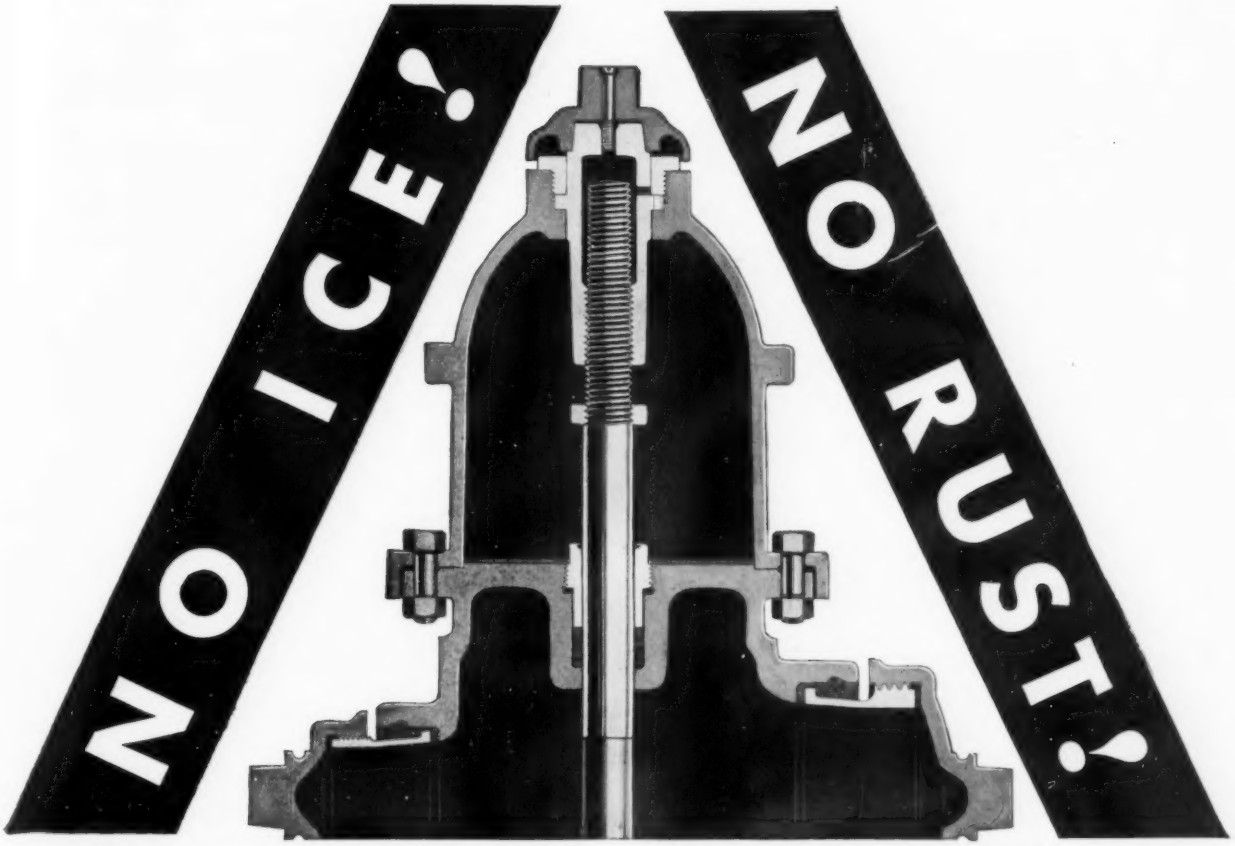
Only ONE machine required for ALL size sewers
Shipped anywhere on thirty days' trial
Complete Line of Sewer Cleaning Equipment

EXPANDING SEWER MACHINE CO. Nappanee, Indiana

LOCK JOINT
Reinforced
Concrete Pipe
PRESSURE - SEWER - CULVERT
Lock-Joint Pipe Co., Ampere, N. J.

Do You Want Prices on Anything?

Readers of THE AMERICAN CITY desiring to secure catalog or price lists on any sort of machinery equipment or supplies for municipal or county work are invited to state their wishes to the Catalog and Price List Department, The American City, 470 Fourth Ave., New York. One letter to us will secure you the information you desire free of all charge, and at a considerable saving of time and correspondence.



THE OPERATING THREAD OF THE MATHEWS MODERNIZED HYDRANT IS SEALED AGAINST MOISTURE

Ice and Rust are vicious enemies of the Fire Hydrant . . . cause delays to the Fire Department when delays are disastrous.

Just think of the supreme satisfaction in knowing that every hydrant is reliably ready for instant operation . . . *never disabled by ice or rust.* That's the assurance that MATHEWS HYDRANTS give year in and year out in any climate.

No moisture can reach the Operating Thread because it is protected from the outside by the Shield Operating Nut and from the inside by the Stuffing Box. Therefore no ice or rust can form at this vital spot to interfere with easy, quick opening and closing.

Give your Fire Fighters these advantages. Install MATHEWS HYDRANTS, *and be surer of reliable service.*

GATE VALVES
VALVE BOXES
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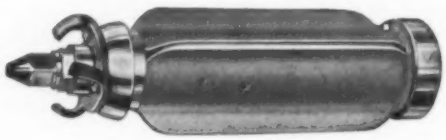
In business continuously since 1803
400 Chestnut Street :-: Philadelphia

CAST IRON PIPE
SAND SPUN
(centrifugally cast)
and PIT CAST
Reg. U. S. Pat. Off.



Self-Propelling Ferret Turbine Sewer Cleaner

Our self-propelling Ferret Turbine is sold on a 30-day free trial.

It is a powerful, handy, well-built tool and is used to great advantage for cleaning dead ends, catch basins to manholes and all stoppages within several hundred feet from the manhole.

When ordering a Ferret please send a male fire hose coupling with the order so that it can be threaded to fit your hose.

Write for our new bulletin 120A on all types of sewer cleaning apparatus made by us.

The Turbine Sewer Machine Company, Inc.
Mfrs. All Types of Sewer Cleaning Apparatus
5210 W. State Street MILWAUKEE, WIS.

Get MORE MAIN Per Dollar...
WITH McWANE CAST IRON PIPE
Sand-Cast
Modern, Bell and Spigot
Sizes 1¼ through 12 inches

McWANE CAST IRON PIPE CO. BIRMINGHAM ALABAMA
PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH

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Los Angeles San Francisco Portland Kansas City

1881 — GOLDEN ANNIVERSARY — 1931

A half-century has demonstrated that the COOK Patent Brass Tube Well Strainer, Fig. 50, possesses qualities which are enduring.

Right Design—A seamless tube, adaptable because of shape and commercial sizes, and cut with accurate slots larger inside than outside. *A direct waterway to pump.*

Right Material—Copper alloys noncorrodible in ground-waters.

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Correct in Design Erected

WE are prepared to submit designs to meet any special requirements for tanks and towers whether on building, odd location or requiring auxiliary units.

COLE tanks offer very distinctive advantages in both design and workmanship. They meet the exacting requirements of all insurance authorities.

Our Engineering Department with an experience of 56 years will be glad to cooperate with you.

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Water Purification Equipment
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Lime-Soda Water Softeners	Dry & Solution Chemical Feeders
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Water Softening and Filtration Plants
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Illustrating "G" *Describing*

RENSSELAER VALVES, COREY HYDRANTS
Tapping Sleeves, Tapping Valves, Crosses, Split Repair Sleeves, Post Indicators, Floor Standards, Air Valves, Valve Boxes, Etc.
RENSSELAER VALVE COMPANY
TROY NEW YORK

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THE NEWPORT CULVERT CO., Newport, Ky.

THIS installation of a GOHI CORRUGATED CULVERT — 36″ in diameter and 246′ long — is on one of the new State Highways of Minnesota. The fill is nearly fifty feet in depth, demonstrating the tremendous *flexible strength* of the culvert. Flexibility prevents breakage from freezing water, settling fills, or pounding of heavy traffic. Made of 99.90% *Pure Iron-Copper Alloy,* GOHI CULVERTS resist the corrosive influences of soil, water and weather. Culverts installed more than 20 years ago show little or no deterioration. For full information, write to the nearest GOHI Fabricator.

GOHI CULVERT MANUFACTURERS, Inc.
Newport, Kentucky

GENUINE OPEN HEARTH IRON
GOHI
TRADE MARK
PURE IRON - COPPER ALLOY
REG. U.S. PAT. OFF.

(Meet copper-bearing pure iron requirements in all accepted specifications for corrugated metal culverts.)

GOHI
PRONOUNCED "GO-HIGH"
Corrugated CULVERTS

LOW COST PUMPING

Low cost per gallon pumped depends upon

(a) Low cost upkeep, and
(b) Low cost for power, as well as upon
(c) Low first cost.

The high-class materials and the skilled design and construction used in DE LAVAL CENTRIFUGAL PUMPS are directed to keeping down items (a) and (b), which ordinarily far exceed (c) in making up the per gallon cost.

De Laval pumps were selected for the new Wanaque pumping station of the North Jersey District Water Supply. As shown in the photograph, there are five single-stage pumps rated at 16,000 g.p.m. each, against 65 ft. at 514 r.p.m., and one single-stage pump rated at 7650 g.p.m. against the same head at 600 r.p.m., all driven by induction motors.

De Laval Steam Turbine Co.
Trenton, New Jersey

4042

Security Sewer Rod

Security Rods are made from second-growth hickory, with malleable iron couplings swedged or shrunk down very tightly on the curved places at end of sticks. Security couplings *cannot* come off.

Joint and unjoint easily and quickly—light weight—long runs easily made. No slack, but lend themselves to all practical bends. They cannot buckle or uncouple in the duct.

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F. BISSELL DIVISION
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Sizes 80 to 10,000 b. hp.

POWERFUL economical dependable types for driving generators and pumps in municipal power and lighting plants and water works. Let us send literature and submit data on costs and performances.

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Division of American Locomotive Company
AUBURN, N. Y.

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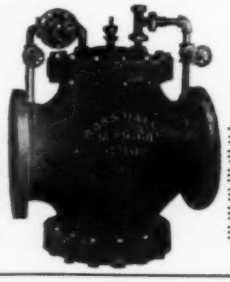
THE STANDARD FOR 50 YEARS

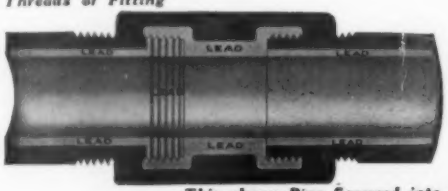
Automatic Pressure Control Valves
Feed Water Filters Portable Fire Hydrants
Hydraulic Engines Hydraulic Booster Pumps

ROSS VALVE MFG. CO., INC.

ARCHIBALD STREET TROY N. Y.



This shows Pipe just entering Lead Threads of Fitting

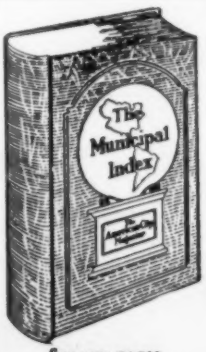


This shows Pipe Screwed into Lead Threads and Shoulder of Fittings

For Dependable Service Installations

"Wakefield" Galvanized

Amalgamated Lead Lined Iron Pipe and Fittings
Low Cost—Easily Installed—Permanent
Inquiries respectfully solicited
LEAD LINED IRON PIPE CO., Wakefield, Mass.



See our pages 450 to 453 1931 MUNICIPAL INDEX

AERO-MIX AERATOR-MIXER PATENTED

Combined Aerator and Mixer

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LOUISVILLE · · KENTUCKY
A.W.W.A. Valves
"Traffic Model" Hydrants

THESE MEN RODE TRUCKS IN 48 STATES AND FOUND NEW WAYS TO SAVE YOU MONEY

General Motors Truck transportation experts went into every section of the country and studied the trucking problems of the eighteen principal truck-using industries. They analyzed methods of distribution by truck, studied truck operating schedules, compared the efficiency of various types of trucks. They uncovered many sources of enormous waste in trucking practice, and they learned how the most successful truck operators in the country have eliminated waste. Now, they are prepared to bring you a complete digest of their findings, to apply the experience of hundreds of American truck operators toward the most economical solution of your individual problems. Their counsel, through the General Motors Truck representative in your locality, is freely at your disposal. If you prefer, we will send you any one of the eighteen specific vocational survey reports or a new booklet (summarizing the results of our entire twenty-month survey activity) entitled "Cutting Distribution Costs with Motor Trucks." A coupon is attached for your convenience.

General Motors Truck Company,
Pontiac, Michigan.

Without placing me under any obligation whatever, send me a copy of your report, "Cutting Distribution Costs with Motor Trucks," also a copy of your survey, if any is available, covering my business.

Name_____

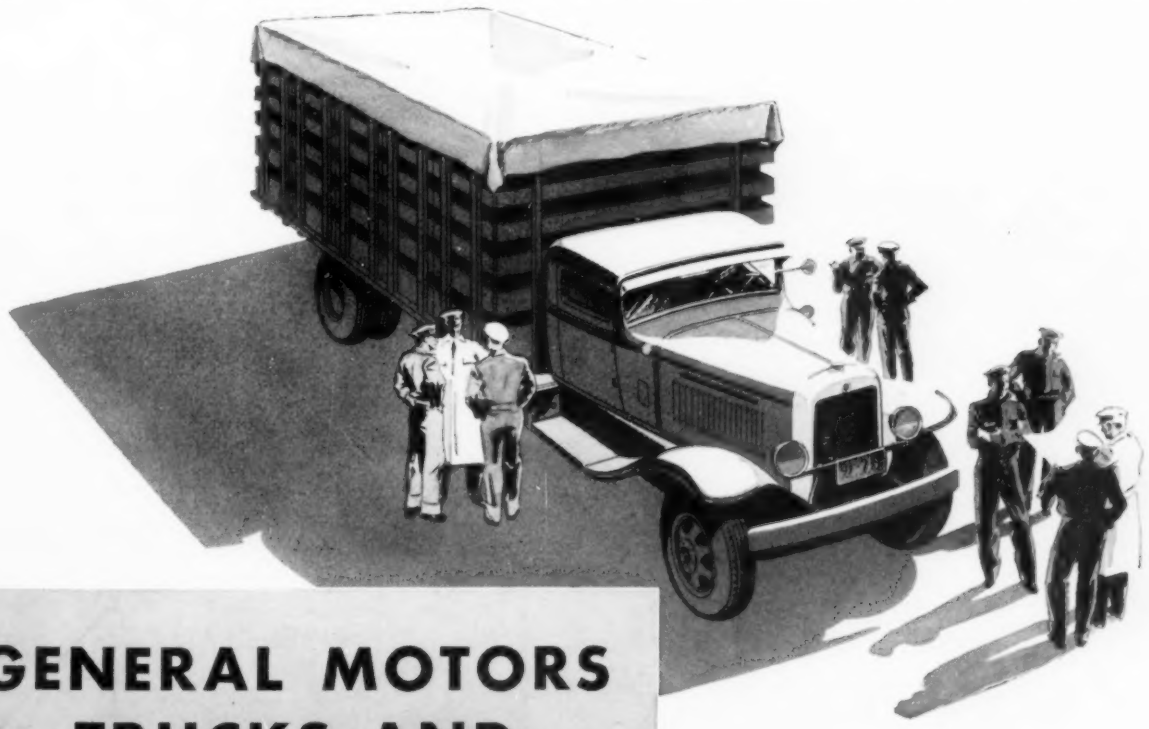
Firm_____

Business_____

Address_____

City and State_____

GENERAL MOTORS TRUCK COMPANY, PONTIAC, MICHIGAN (A Subsidiary of Yellow Truck and Coach Mfg. Co.)



GENERAL MOTORS TRUCKS AND TRAILERS

THE RIGHT TRUCK FOR EVERY RUN—1½ TO 20 TON

Time payments financed at lowest available rates through our own Y. M. A. C.

When you write for that catalog, kindly mention THE AMERICAN CITY

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Doctors advise us to drink all the water possible, and in the same breath, they warn us against germ-carrying drinking vessels.

This advice guided Rundle-Spence in designing Vertico-Slant drinking fountains—the bubblers with the true hygienic advantages. In R-S fountains the water spouts angularly from a small jet (nozzle). Neither lips nor excess water can come in contact with it . . . an unusual health-protecting advantage.

R-S fountains come in a variety of colors and are fully described in our current catalog. Write for it.

RUNDLE-SPENCE MFG. CO.
446 No. Fourth St. Milwaukee, Wisconsin

RUNDLE-SPENCE

LIPS CAN NOT TOUCH THE R-S NOZZLE

Stewart FENCES

How Does Stewart Defeat Rust and Lengthen Life of Fence?

The answer to the question "how Stewart has practically eliminated rust corrosion and lengthened the life of Fence for municipal purposes" is to be gleaned from pages 536, 768, 769 and 801 of the 1931 issue of The Municipal Index.

And while you are about it take note that the Stewart Line Post is the strongest and heaviest in standard use and that fabric is woven into corner posts.

Stewart has been fabricating superior Wrought Iron and Chain Link Wire Fence for municipalities for well-nigh 46 years.

Always—ALWAYS—no matter how large or small the job is, let Stewart estimate on your requirements. Stewart can save you money.

The Stewart Iron Works Co., Inc.
"Fence Builders to American Cities Since 1886"
702 Stewart Block Cincinnati, Ohio

Stewart FENCES

PLAY DEVICES FOR YOUR PLAYGROUNDS and PARKS

If you are interested in installing some park or playground equipment that is superior in design and quality send for this catalog which illustrates a complete line of popular playground devices.

AMERICAN PLAYGROUND DEVICE CO.
ANDERSON, INDIANA

COMBINATION NO. E-125
EverWear Playground and Water Apparatus. The recognized standard of safe and permanent value for the playground and swimming place.

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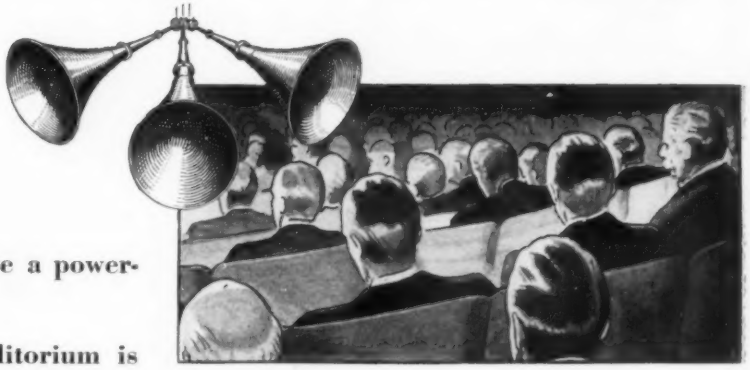
The EverWear Manufacturing Company
Box 103, Springfield, Ohio

A public hearing that is *really a hearing!*



The speaker doesn't have to have a powerful voice when the municipal auditorium is equipped with a Western Electric Public Address System. No one with normal hearing need cup hand to ear. **Public Address equipment picks up speech or music, amplifies it undistorted and distributes it to one outlet or many. Cities use this apparatus in city halls, too, in court rooms, stadiums, parks. Fill out and mail the coupon for complete story.**

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PUBLIC ADDRESS AND MUSIC REPRODUCTION SYSTEMS

Distributed by* GRAYBAR *Electric Company

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Gentlemen: Please send us the story of the Public Address System.

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ADDRESS .....

CITY ..... STATE .....

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Main Offices
ELIZABETH, NEW JERSEY

Manufacturers of

Flashing Beacons
Stop and Go Signals
Reflector Signs and Signals
and other Traffic Accessories

COMPLETE
ECONOMICAL
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Modern

INCINERATION

Morse Boulger performance is *proved*. Thorough destruction of all kinds of refuse . . . efficient operation, low labor cost, low maintenance, reliability . . . *trouble-free* performance without nuisance from odor or smoke. It is *modern* incineration for modern communities. Investigate . . . for complete, economical, odorless results!

Morse Boulger Destructor Co., Inc.
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HEAVY-DUTY INCINERATION
MORSE BOULGER DESTRUCTORS

"EARLY SIGNS"
THE ORIGINAL AND MOST POPULAR

IN USE IN OVER 400 CITIES AND TOWNS

Porcelain enamel plates are guaranteed for 10 years against fading or chipping. Certified malleable iron frames and staff. Adjustable to any angle. *Agents Wanted*

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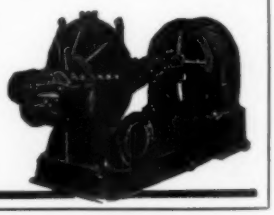
CENTRIFUGAL PUMPS

FOR water supply, unwatering, drainage, fire service, irrigation, circulating, boiler feeding, hydraulic mining, etc. We have or will build to meet any pumping conditions and for any power—belted, electric, steam or gasoline engine.



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MORRIS MACHINE WORKS
BALDWINSVILLE, N. Y.

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SIGNS & SIGNALS

LYLE manufacturing methods are particularly adapted to making of reflector signs and signals. Write for catalogs on CARVED IN signs, embossed steel signs, reflector signals in 25 different designs and sizes.

Also ask for new booklet on Solutions of Traffic Problems.

LYLE SIGNS, INCORPORATED MINNEAPOLIS, MINN.

***The* MADISON**

Overlooking Ocean at Illinois Avenue

ATLANTIC CITY, N. J.

For the better enjoyment of late Autumn and early Winter . . . for the charm of Colonial antiquity . . . service as modern as tomorrow . . . comfort that gives a true, new luxury to rest and play . . . come to THE MADISON.

Attractive Winter Rates on American or European Plan

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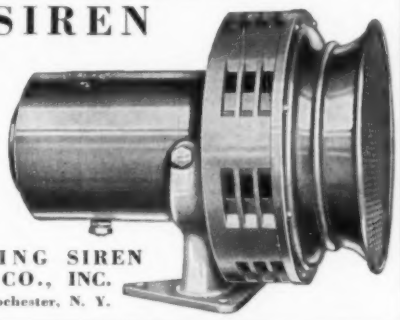
EUGENE C. FETTER, *Managing Director*

THE STERLING "FREE ROLLING" SIREN

THE GREATEST SIREN IN THE WORLD



THE STERLING SIREN FIRE ALARM CO., INC.
63 Allen St. Rochester, N. Y.

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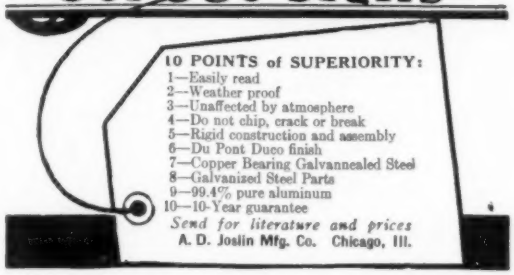

ILLUMINATED TRAFFIC ARROW

Directional arrows visible equally by day and night

Write today for Booklet

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Chrysler Building, New York City
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WHERE AM I, MISTER?

How often is that question asked in YOUR city, not only by strangers in town, but by your own citizens living in other sections? And all because your streets are not properly marked!

Our latest development in street signs will allow you to erect them on every corner.

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A four-way porcelain enamel sign, in aluminum holder, ready to mount on 2-in. post, complete, in reasonable quantities 6.50

ROCHESTER STREET SIGNAL CO.
396 Platt Street Rochester, N. Y.

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POLICE RADIO

THERE IS NOTHING MYSTERIOUS OR COMPLICATED IN A POLICE RADIO SYSTEM

DON'T BE MISLED BY FLOWERY SALES TALK

De FOREST POLICE RADIO SYSTEMS ARE ALL CUSTOM-BUILT TO MEET YOUR COMMUNITY'S REQUIREMENTS AND TO MEET FEDERAL RADIO COMMISSION'S RULINGS AS TO POWER RATING AND FREQUENCY STABILITY.

INVESTIGATE AND LEARN WHY De FOREST HAS THE LOWEST UPKEEP COST

A Copy of "Radio in Police Signal Work" is Yours for the Asking

DE FOREST RADIO COMPANY
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POLICE RADIO ALARM SYSTEMS

WHY WASTE RELIEF FUNDS

by *chopping* out stumps?

PROPER TOOLS
INCREASE EFFICIENCY 1000 PER CENT

PROPER METHODS
REDUCE FUTURE UPKEEP COSTS
Use your funds to clear more area!

LOW-COST STUMP PULLING EQUIPMENT
Leased or Sold *Reasonable Rates*

Hand Puller at Work

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98 Pine Street New York City

Send for Details

Without obligation please send information on economical removal of growth

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Address.....

City and State.....

TOKHEIM

2 Features of the Tokheim CHRONOPLAN System of Traffic Control

—Moves traffic efficiently!

The control and movement of traffic is efficient only when the minimum amount of time is utilized in stopping and starting a group of cars. The CHRONOPLAN System obtains this objective in individually compensating blocks of unequal length and intersections subject to varying amounts of cross-traffic.

—Continuously!

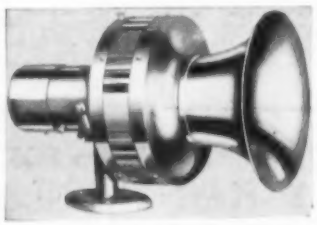
With the time cycle set up to permit traffic to move at a certain safe speed per hour, the Tokheim CHRONOPLAN System moves traffic continuously. It naturally follows that the main artery under control, becomes a veritable "through" street, on which a group of cars, or groups of cars, seldom need stop.

—Ask for a copy of Bulletin No. 2000, an interesting discussion of efficient traffic control.

TOKHEIM OIL TANK & PUMP CO.
Fort Wayne, Indiana

CHRONOPLAN

THE NEW FEDERAL "COASTER" SIREN

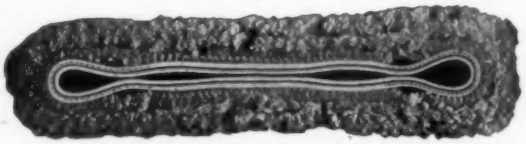


MORE sound volume to meet modern traffic demands. This siren "clears the way for blocks ahead."

Write for Bulletin 36A

MOST POWERFUL APPARATUS SIREN

FEDERAL ELECTRIC COMPANY
8701 South State Street
CHICAGO ILLINOIS



BI-LATERAL FIRE HOSE

is an improved construction

It is always reliable for fire service no matter how old, if the jackets are intact. Three tube lining.

The one hose that does not require frequent replacements. Six-year guarantee.

BI-LATERAL FIRE HOSE CO.

20 No. Wacker Drive CHICAGO, ILL.
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PERMANENCE

Is an inherent characteristic of Brass street signs. Brass, the non-corrosive metal, is used in their construction.

Write for a list of Brass street sign installations that have stood the test of time.

Catalog sent on request

UNION IRON PRODUCTS CO.
Department H East Chicago, Ind.

City of Providence, Rhode Island—

Sealed Proposals will be received at the office of the City Clerk, City Hall, until 2:15 o'clock P. M.

MONDAY, DECEMBER 21, 1931

FOR FURNISHING TO THE CITY OF PROVIDENCE, 2—100-TON INCINERATOR UNITS IN PLACE, INCLUDING FOUNDATIONS, STRUCTURE TO HOUSE SAME AND SUCH OTHER WORK, LABOR, MATERIAL AND EQUIPPING OF SAID INCINERATOR UNITS, as contained in the plans and specifications for the erection and completion of said two-unit incinerator in the City of Providence.

A certified check payable to the order of the City of Providence, for One Hundred Dollars ($100.00), will be required from prospective bidders to insure the return in good condition of the specifications and blue print copies of the drawings issued by the City of Providence. Specifications and blue print copies of the drawings must be returned within ten (10) days after date of the opening of proposals or deposit will be forfeited.

Terms and Requirements for Bidding and Specifications may be obtained at the office of the City Engineer, City Hall.

By Order of the Board of Contract and Supply

RAYMOND P. McELROY
Clerk

JAMES E. DUNNE
Mayor and Chairman

Quick Traction for Glary Ice

WET pavements suddenly turn into veritable ice skating rinks with a few degrees drop in temperature. Motorists are caught unaware and before you know it a score of skidding accidents result.

This newly formed ice demands quick action. An ingenious maintenance official hit upon a method to provide quick traction. He loads up a truck with coarse sand saturated with Calcium Chloride and attaches his Calcium Chloride spreader, the same as is used in road dust prevention work in the summer. With this outfit he quickly spreads coarse sand saturated with Calcium Chloride over wide stretches of icy pavement.

This coarse sand with its Calcium Chloride coating melts just enough ice to dig in and anchor itself firmly, thus giving excellent traction. Wind or traffic will not dislodge the particles as it does untreated materials lying loose on the top of the ice.

Many communities now place stock piles of cinders, coarse sand or gravel near hills and curves where they are always ready when the ice hazard arrives. Due to the Calcium Chloride these piles of tractive materials do not freeze and become unusable after rains and snows.

For removing an accumulation of ice, such as at frozen drains and culverts, flake Calcium Chloride spread on direct will quickly melt all ice. Further details on this interesting subject will be gladly furnished you. Just mail the coupon.

Calcium Chloride Publicity Committee

Mail the coupon to any one of these companies

Solvay Sales Corporation, 61 Broadway, N. Y. City
The Dow Chemical Company, Midland, Michigan
The Columbia Alkali Corporation, Barberton, Ohio

Without obligation please send complete details on the use of Calcium Chloride for providing traction on icy pavements.

Name

Address

AC 12-31

CALCIUM CHLORIDE

"makes Ice Safe for Traffic"

Fifth Avenue, from 23rd to 25th Streets, New York City, a finished pavement of granite block with Socony Asphalt Joint Filler

STANDARD ASPHALTS

SOCONY BRAND

Standard Cut-Back Surfacing Asphalt.

Standard Asphalt Binder A for surface treatment.

Standard Asphalt Binders B and C for penetration work. (*Asphalt Macadam.*)

Standard Paving Asphalt 51-60 and 61-70 Penetration for the mixing method. (*Asphaltic Concrete.*)

Standard Cold Patch Asphalt for all types of patching.

Standard Refined Asphalt for sheet asphalt paving.

Standard Asphalt Joint Fillers.

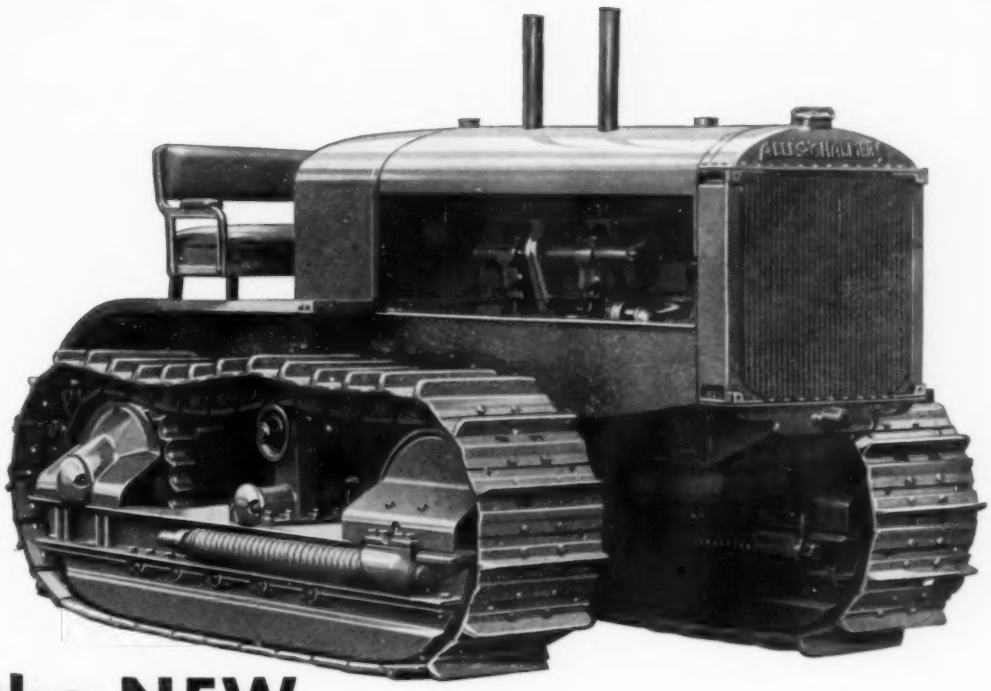
Standard Waterproofing Asphalt.

SOCONY ASPHALTS AND ROAD OILS

Specifications and all other particulars furnished upon request

STANDARD OIL COMPANY OF NEW YORK

6 SPEEDS - 6 CYLINDERS



in the NEW HEAVY DUTY FAST MODEL "L" TRACTOR

Think what it means on a dirt-moving job — in many cases three round trips from load to dump while other tractors make two — hauling more — moving more dirt on each single trip.

When you realize that Allis-Chalmers Model "L" Tractors have been in the toughest kind of service well over 4,000 hours — with practically no repair expense—you know they are built to last.

Consider these Model "L" features—high road clearance, unit construction—no frame or subframes, easy accessibility to all working parts, valve in head engine and replaceable cylinder liners.

It's a knockout! Allis-Chalmers Dealers are ready to show you—

Allis-Chalmers

MILWAUKEE, U. S. A.

TRACTOR POWER FOR EVERY PURPOSE

Mention THE AMERICAN CITY—it helps.

LEADITE

Trade Mark Registered U.S. Pat. Office

Laying 36-in. Cast-Iron Pipe with LEADITE Joints, in Tulsa, Okla.

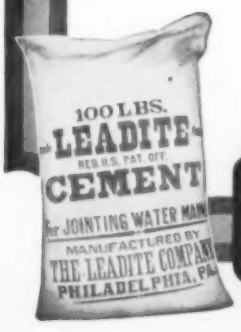
LEADITE *Speeds-Up* Water Main Construction

Thoroughness and speed in laying water mains are important items (no question about that).

When LEADITE is used as a jointing material for bell and spigot water mains practically all installation costs are reduced—and, most water works men know that LEADITE makes good joints.

From the elimination of caulking charges, reduction of cost for bell hole excavation, to the saving in handling charges on the job, LEADITE has proved a money saver on thousands of miles of bell and spigot pipe of all sizes from 4 in. in diameter to 84 in. in diameter. In fact, a list of the satisfied Water Works who have successfully used LEADITE—reads like a "Blue Book" of the Industry.

The Pioneer self-caulking material for c. i. pipe.
Tested and used for over 30 years.
Saves at least 75%.



THE LEADITE COMPANY
Land Title Building Philadelphia, Pa.

No Caulking

MAINTENANCE

— Service must carry on at any price!

Destructive storms sweep down their courses, causing costly damage — undoing work well-done — But the pause is short-lived, lines are put back in condition, communication, transportation, and supplies must carry on regardless of cost.

In a like measure, should trouble arise on lines equipped with Badger Water Meters, the lull in service is comparatively small — for Badgers show surprisingly low maintenance costs. This is due to simplicity of design and unit assembly. A complete unit can be replaced in less time because it is readily accessible — at low labor costs — with less loss in service — a worth-while Badger feature.

Badger disc meters have the largest capacities, size for size, with the least absorption of pressure and are especially sensitive and accurate on small streams as well as the maximum capacity flows. They are made under the most exacting manufacturing processes known to long experienced and successful meter manufacturers.

Know Badger Meters better. You can have full details by writing for bulletin No. 300.

BADGER METER MFG. CO.
MILWAUKEE, WISCONSIN

Branch Offices In:

New York City — Waco, Texas
Cincinnati, Ohio — Savannah, Ga.
Chicago, Ill. — Seattle, Wash.
Los Angeles, Calif. — Philadelphia, Pa.
Kansas City, Mo.

BADGER Water METERS

EVERYTHING you want in a piece of fire-fighting equipment... ...but no frills*

No internal strains

No warping . . . no internal strains . . . no chance for parts to get out of alignment . . . slow, patient "curing" of all castings by Mother Nature takes care of that.

No drain troubles

The automatic drain on the Columbian hydrant is built in . . . *an integral part of the main valve* . . . no springs, toggle joints or synchronized screw adjustments to get out of fix . . . and is *patented*.

No gasket troubles

Here again *simplicity* (the stubborn foe of frills) means less work and worry for Columbian users. There can be no gasket troubles for the simple reason that this metallic gasket comes out with the seat ring due to *patented* undercutting of seat ring.

No failures underground

The use of waterproof, acidproof and heatproof Vim leather washers removes all chance for underground failure.

* These exclusive, *patented* features are based on a single, sound idea . . . to *simplify* the most important piece of fire equipment you buy . . . and in doing that to insure greater ease of operation and longer life.

Branch Sales Offices

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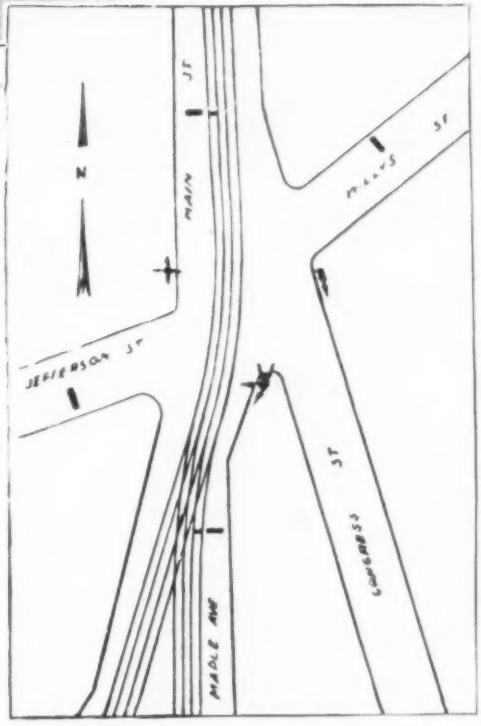
Boston Pittsburgh Dallas Albuquerque
New Orleans

Columbian
IRON WORKS
CHATTANOOGA, TENNESSEE

Traffic at the intersection of Maple Avenue, Main, Jefferson, Willys and Congress Streets in Hartford, Connecticut, has been handled by Traffic-Actuated Control for the past two years. The conflicting flows have been separated and traffic is now regulated through the intersection with smoothness and precision unobtainable under the previous method of fixed-time control. The diagram pictured below shows the complexity of this intersection.



In Hartford

TRAFFIC-ACTUATED CONTROL

Before the installation of Traffic-Actuated Control at this complicated five-way intersection, the major problems experienced were the high accident rate and a tremendous amount of congestion. This intersection is a focal point for crosstown traffic. This local traffic is greatly added to by a heavy influx of out-of-town traffic on Main Street which is U. S. Route 5. Conditions at this intersection are further complicated by a moderately heavy pedestrian movement which includes a large number of school children.

Since the installation of Traffic-Actuated Control at this intersection the accident rate has been reduced to a remarkable extent, unnecessary delay and congestion has been entirely eliminated and street efficiency has been improved beyond expectation.

The graduate traffic engineers of the Automatic Signal Corporation will be glad to confer with you on the traffic problems in your municipality. There is no obligation incurred.

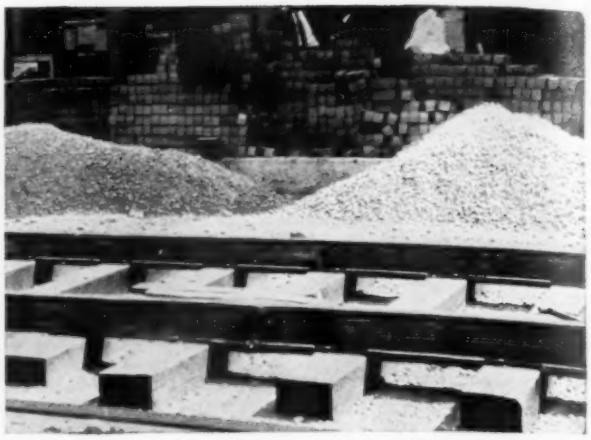
ELECTRO-MATIC

VEHICLE-ACTUATED

TRAFFIC DISPATCHING SYSTEMS

AUTOMATIC SIGNAL CORPORATION

NEW HAVEN, CONN. CHICAGO, ILL.



MECHANICAL TIE *or* **WOOD TIE**

Carey Elastite RAIL FILLER

Protects Paving next to Tracks

The deterioration of paving next to tracks is primarily caused by rail vibration. Carey Elastite Rail Filler, placed in the web of the rail as shown by the above photographs, provides a resilient cushion against vibration which would otherwise be transmitted to the adjacent paving. Paving "kick-ups" are thus prevented, with a consequent reduction of paving maintenance expense.

Elastite Rail Filler is an asphalt compound reinforced with tough fibres. Resistant to moisture and unaffected by climatic extremes of temperature, it requires no attention after its installation. The labor cost of its application is reduced to the minimum because the material is preformed to fit any type rail.

The value of Carey Elastite Rail Filler has been proven by installations in every part of the United States. We will gladly supply samples, prices and full information on request.

THE PHILIP CAREY COMPANY -:- Lockland, Cincinnati, Ohio

Branches in Principal Cities

BUILT-UP ROOFS
ASPHALT PRODUCTS
ELASTITE EXPANSION JOINT
WATERPROOFINGS
ROOF PAINTS

Carey PRODUCTS EST. 1873

HEAT INSULATIONS
ASBESTOS MATERIALS
CAREYSTONE CORRUGATED SIDING
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BUILDING PAPERS

540

Saves 91.3%

on street cleaning costs!

This Austin Motor Pickup Sweeper cut street cleaning costs 91.3% in University City, Missouri

University City, Mo., cuts costs from $11.51 to less than $1 per mile with an Austin Motor Pickup Sweeper

To anyone who scans the record of economies effected by using Austin Motor Pickup Sweepers it is apparent that the question confronting municipal officials is, "Can we afford *not* to use this modern equipment?" For example, consider the experience of University City, Mo., the largest suburb of St. Louis. This case is typical of Austin economy and efficiency.

Using the old hand-and-broom method of street cleaning, it costs University City $11.51 per mile to clean its streets. Many were cleaned less than once a month and the business section was cleaned only once a week. An Austin Motor Pickup Sweeper was purchased in October, 1929, to replace this obsolete, unsatisfactory cleaning method. Now the business section of University City is cleaned *daily* during the early hours of the morning. Residences and outlying streets are cleaned *three times* a week. Costs have been reduced from $11.51 to less than $1 per street mile or 50 cents per gutter mile—a saving of 91.3 per cent!

These features explain Austin superiority

42-inch Oscillating Gutter Broom: The extra large wire gutter broom on the Austin clears away all trash and scours through dirt and caked mud to leave the gutters clean. This 42-inch broom is the largest on any motor sweeper.

Beltless Pickup Elevator: The *beltless* Austin elevator has steel-mounted rubber squeegees on steel roller chains. Handles broken bottles and all other refuse without damage or costly replacements.

4-Wheel Chassis: The sound mechanical principles of the 4-wheel type chassis, with its springs under the motor, favored by automotive engineers for stability and handling ease, give the Austin rugged strength and freedom from distortion.

The choice of progressive officials

A study of Austin features and a review of the low-cost performance of these machines in actual service provide ample explanation of the wide use of Austin Motor Pickup Sweepers in municipalities, large and small. Let us send you interesting information that will point the way to worthwhile savings. There's no obligation. The Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, Illinois. Branches in principal cities.

Austin-Western
ROAD MACHINERY

PLUG THOSE LEAKS

AN inaccurate water meter is like a leaky pail—*wasteful.* Plug the leaks in your metered services. Turn waste into profit. Install Hersey Meters. They maintain their initial registration accuracy over a period of many years. They plug the leaks in municipal finances that go with the use of less accurate meters.

In the Hersey Meter the disc piston is perfectly balanced. No guides that introduce friction and wear and detract from accuracy are necessary. Perfect balance assures extreme sensitivity. Streams as small as 1-32 of an inch are accurately registered. Rigid testing is enforced in the Hersey Plant. Hersey inspectors discard all parts not within a ten-thousandth of an inch limit.

For *accurate* meters that will return just revenue, write the nearest Hersey Branch Office. An engineer there will gladly specify for you.

THE HERSEY DISC METER

Strength, Accuracy, Dip-tinning, and Balance make this meter your best investment.

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16-FOOT
LARGE
DIAMETER
MONO-CAST
PIPE

makes economical installations

Looking down a line of 24-inch Mono-Cast Centrifugal Cast Iron Pipe recently laid in the mid-western prairie section. Splendid laying records were made under these ideal conditions, but Mono-Cast's 16-foot lengths are even better appreciated where the going is tough.

LARGE-DIAMETER Mono-Cast Centrifugal Cast Iron Pipe lowers costs all down the line. It is lighter—*yet stronger*—than pit-cast pipe, therefore it costs less initially. One-fourth fewer pieces per line are required, because Mono-Cast is furnished in 16-foot lengths; therefore the labor and expense of handling, digging bell holes, packing, pouring, caulking and supervision are reduced one-fourth. For the same reason, the chances of leakage are one-fourth less. These are practical points of superiority which, backed by the well-known permanence of cast iron pipe, make Mono-Cast pipe the first choice for installations like the one pictured here. Have you the facts on Mono-Cast Pipe? If not, write nearest Acipco office for detailed information, quotations, etc.

MONO CAST IRON

Lower Costs with Mono-Cast

Mono-Cast Centrifugal Cast Iron Pipe is now furnished in diameters from 4 to 24 inches, inclusive, in 16-foot lengths. These 16-foot lengths, plus the fact that Mono-Cast is lighter, yet stronger, than pipe made by the old process, enable you to make savings as large as 25 per cent all down the line as compared with pit-cast pipe.

AMERICAN
CAST IRON PIPE COMPANY
BIRMINGHAM, ALABAMA

NEW YORK CITY CHICAGO KANSAS CITY MINNEAPOLIS
CLEVELAND DALLAS LOS ANGELES SAN FRANCISCO SEATTLE

DIETZ
DIETZ LANTERNS
LANTERNS

UNFAILING
IN STORMS

When ordering lanterns it pays to remember that burning dependability and superior lighting power are mainly assured by internal factors that you cannot see. These factors have given Dietz Lanterns preeminence throughout the world. They are inherent in every Dietz Lantern, regardless of its style or price.

R. E. DIETZ COMPANY
NEW YORK
Largest Makers of Lanterns in the World
FOUNDED 1840
DO YOU USE TORCHES? WE MAKE THEM!

USE RED
No other color means DANGER

—but he cannot damage Trident Frost-Proof Meters

Neptune pioneering first perfected the cast-iron breakable meter-bottom that gives way before any other parts of the meter can be damaged by freezing water. Note how the broken bottom permits the "snap-joint" measuring chamber to spread apart. A new cast-iron bottom is put on at very nominal cost for labor and material. Lambert Meters are also frost-proof.

Note: Above drawing does not show projecting "sand-ring"—now a standard part of the Disc Chamber.

NEPTUNE METER CO.

THOMSON METER CORPORATION
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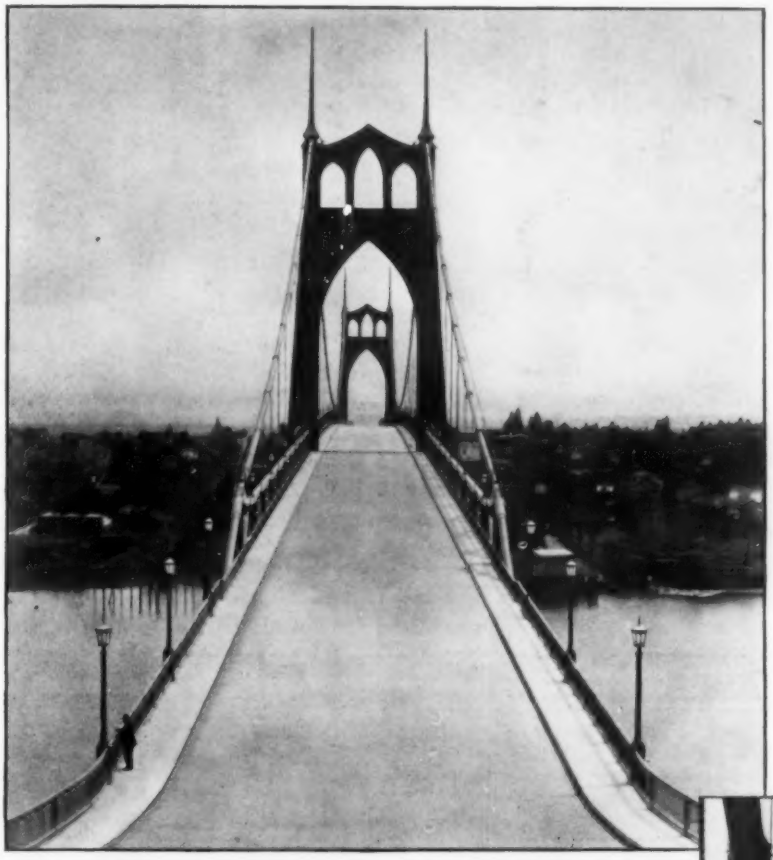
Pioneers in Meter Progress — Yesterday — TODAY — Tomorrow

TRIDENT & LAMBERT METERS

NEARLY 5¾ MILLION MADE AND SOLD THE WORLD OVER

G-E Luminaires

Light the Way across the Willamette



St. John's suspension bridge, illuminated with G-E luminaires on Union Metal standards

WHEN Portland, Oregon, spanned the Willamette River with the beautiful St. John's suspension bridge, the logical lighting equipment was an installation of G-E Novalux luminaires of lantern type to harmonize with the Gothic architecture of this noble structure. One hundred and eight of these luminaires afford perfect illumination for night traffic and give an added touch of distinction by day.

In planned city lighting, bridges require as careful consideration as the streets that lead to them. General Electric's Illuminating Engineering Laboratory is always ready to coöperate with city officials and architects in recommending lighting equipment that will be in keeping with the adjacent street installations and with the bridge architecture. The laboratory is also prepared to make scientifically correct recommendations for the lighting of underpasses—with a special view to protecting and expediting traffic.

720-174

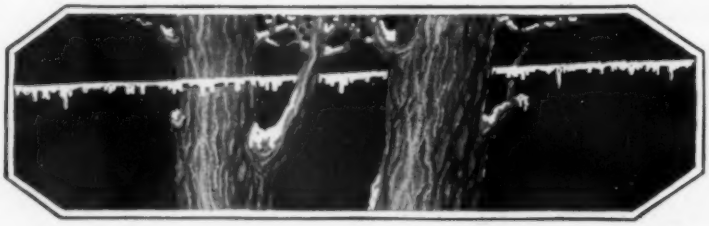
GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

The GEORGE WASHINGTON BRIDGE *across the Hudson in New York* has the longest suspension span in the world. The entire bridge *is* LIGHTED *with* HOLOPHANE REFRACTORS. Complete information on this installation, or data on bridge lighting in general, furnished on request. Address HOLOPHANE CO., Inc., 342 Madison Avenue, New York. Offices also in Chicago, Toronto and San Francisco.

Holophane
Trade Mark

Why take a chance, MR. UTILITY?



Make sure your overhead wires are in good condition—ready for a winter of service. It will cost much less to pick out the weak spots now rather than later when trouble occurs. Circuits that come in contact with trees are most likely to harbor bad spots—insulation that is frayed and worn from continuous rubbing against trees. When such places are found splice in FIBREX Tree Wire; it will not wear through—because it has a fibrous non-metallic protection that is practically wearproof.

Many companies are installing FIBREX Tree Wire on their primary, secondary and arc circuits wherever lines extend through trees. By so doing they reduce their overhead maintenance costs and make it easier to maintain uniform line voltage.

Every distribution engineer should have a piece of FIBREX for examination. A short sample and complete information will be sent upon request. Write today.

SIMPLEX WIRE & CABLE Co
MANUFACTURERS
201 DEVONSHIRE ST., BOSTON

CHICAGO CLEVELAND PHILADELPHIA NEW YORK JACKSONVILLE SAN FRANCISCO

SIMPLEX INSULATED WIRES AND CABLES

A heavy truck struck this standard so hard it nearly uprooted the concrete foundation. Thanks to the Safety "Spider" this post not only remained standing, but remained lighted as well.

This Safety *"Spider"* protects lives and property

Ordinary traffic accidents will not overthrow King Ferronite Street Lighting Standards, thanks to the extra mechanical strength of Ferronite and also to the protection afforded by the sturdy King Safety "Spider." ¶ Lives of passing pedestrians are safeguarded—as are parked cars nearby. Also, the lighting unit and the standard are saved. ¶ The "Spider" consists of four steel rods welded to a steel pipe extending up through the standard. ¶ The development of the Safety "Spider" is only one instance of Graybar's work in promoting better Street Lighting. Graybar's Street Lighting experts are always available to show you how to improve *your* Street Lighting. Their advice is all the more valuable in not being partial to any one type of standard.

GraybaR

OFFICES IN 76 PRINCIPAL CITIES.
EXECUTIVE OFFICES: GRAYBAR BLDG., N. Y.

"Spider" prevented this standard from being overthrown. Ordinarily, damage to the standard is restricted—requiring only a simple welding repair job.

This unprotected post crashed to the ground. Not only are pedestrians endangered—but the fall may shatter standard beyond repair and destroy the lighting unit.

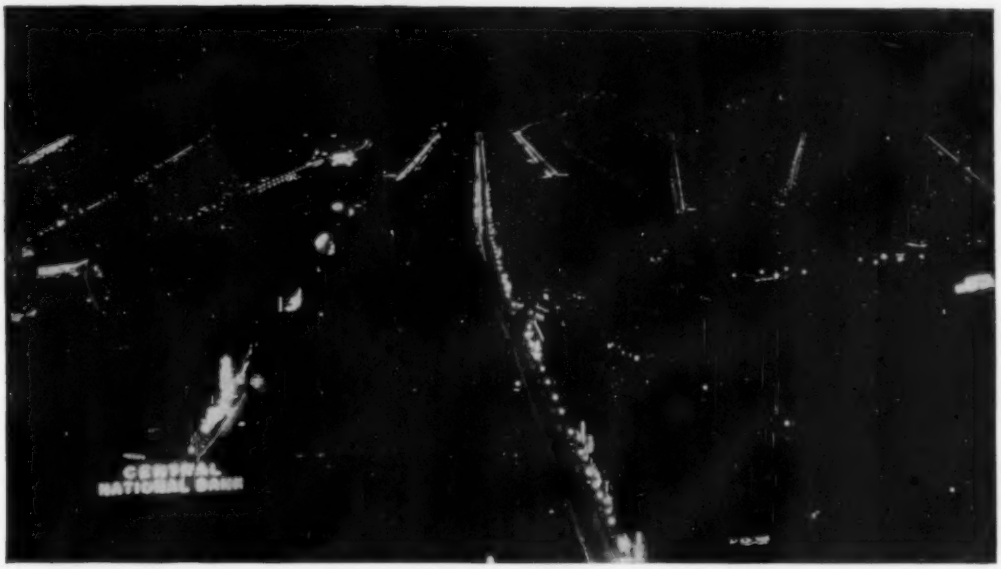
On 16,000 officials' desks!

City, Town, County and Water-works Officials everywhere tell us they find practically everything they need in the way of information on municipal and water-works equipment in this one handy volume.

If you have not already seen a copy of the 1931 Municipal Index, write us.

THE AMERICAN CITY MAGAZINE CORPORATION
Publishers of THE MUNICIPAL INDEX
470 Fourth Avenue New York

Why not remember to mention THE AMERICAN CITY?



"Gleason-Tiebout glassware is specifically adapted to the right illumination of each street"

CORRECT STREET LIGHTING IS A MAJOR FACTOR IN CITY PLANNING

Form 12—Novalux luminaire with ornamental frame and 125 and 1126 glassware.

Street lighting is essential. **Its adequacy measures the difference between "just a city" and a *progressive* city. Planned street lighting will, by itself, improve any municipality. In addition, practically every other public improvement and expansion depends on correct lighting for the full measure of its intended benefits.**

For this reason, a scientific lighting program should receive adequate provision in every budget.

Such a program will specify appropriate luminaires, correctly located, for heavy- and light-traffic streets, business areas, residential sections, and "through" arteries.

Gleason-Tiebout is nationally known for the correct, artistic design of its street-lighting glassware—specifically adapted to the right illumination of each street and to the utmost distinction of appearance by day.

Gleason-Tiebout makes glassware to meet specifications of General Electric street-lighting engineers. These engineers will be glad to assist in planning installations that will exactly meet every requirement.

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Makers also of the famous Celestialite for lighting of interiors

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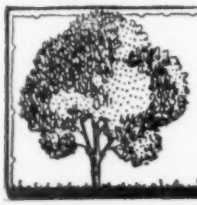

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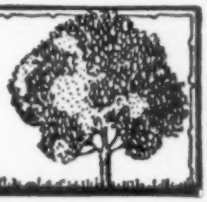

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Volume XLVI January-June, 1932

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